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LETTERS OF E. A. SCHWARZ

The letters written by the late Dr. E. A. Schwarz are so full of entomological knowledge presented in a most intimate and entertaining manner, that the publication committee of the New York Entomological Society feels especially fortunate in being able to publish a considerable number of them in the pages of the JOURNAL.

A request for such letters printed in *Entomological News*, December, 1928, met with immediate and enthusiastic cooperation. Dr. L. O. Howard made a careful selection of those contained in the files of the United States Bureau of Entomology and obtained Dr. Marlatt's permission for their publication, while Herbert S. Barber sent those received by him, and most fortunately found among Schwarz's effects the wonderful letters written by Schwarz to his intimate friend, Henry G. Hubbard. The letter to Herbert S. Barber reproduced in facsimile on plate VII is an excellent example of the characteristic very small but distinct penmanship of Dr. Schwarz.

Dr. Walther Horn of Berlin sent copies of the early letters written, 1866 to 1872, to G. J. H. Gerhardt and to the eminent Dr. Kraatz.

Dr. H. C. Fall loaned several letters addressed to himself and a few others written by Schwarz to Frederick Blanchard, while Frank Walters, the book dealer, kindly loaned the Schwarz letters contained in the portfolios of Mrs. Annie Trumbull Slosson.

Miss Hazel Gay, assistant librarian of the American Museum of Natural History, and her colleague Miss Margaret Titcomb, have earned our heartfelt thanks by typing the entire series of letters in preparation for the printer.

The various letters selected for publication have been arranged and are published in chronological sequence.

JOHN D. SHERMAN, JR.

E. A. Schwarz an G. J. H. Gerhardt

Breslau 11.6. 69.

Geehrter Herr,

Hoffentlich werden Sie mir es nicht übel nehmen, wenn ich mir erlaube, Ihnen beifolgend eine Probe der corsischen Käfer schicke, welche theils mein Bruder in Ajaccio gesammelt, theils mir von meinem Correspondenten, Herrn Manès, aus Corsika zugeschickt worden sind. Es sollen aber nur vorläufige Proben sein und zwar nur solcher Arten, welche ich in Ihrem Cataloge nicht angestrichen fand und wenn Sie auch inzwischen von H. v. Kiesenwetter und auch von mir einige Arten der Sendung erhalten haben werden, so wird doch der grösste Theil davon in Ihrer Sammlung noch nicht vertreten sein.—Im Allgemeinen sind die von meinem Bruder gesammelten Käfer diesmal in besserem Zustande angekommen, als dies bei seinen früheren Reisen der Fall war, wenngleich bei manchen guten Arten wie z.B. *Harpalus ovalis*, *Drypta distincta* die meisten Exemplare mehr oder weniger zerbrochen sind. Was die Qualität der ca. 3000 an Zahl gesammelten Käfer belangt, so sind meine Erwartungen in Anbetracht dessen, dass ein Nichtentomologe gesammelt hat, bei weiten übertroffen worden; was könnte ein geschulter Entomologe und erfahrener Sammler nicht dort leisten? Das Bestimmen der Käfer unterliegt natürlich grossen Schwierigkeiten schon aus dem Grunde, weil es fast unmöglich ist, die nothwendigen literarischen Hilfsmittel vollständig zur Hand zu haben. Damit Sie ein ungefähres Bild der Fauna von Ajaccio erhalten nenne ich folgende Arten, die ich bis jetzt bestimmt habe:

Im Ganzen sind es gegen 400 Arten unter denen *Atronus collaris* unstreitig das interessanteste Thier ist; diese Art scheint von den corsischen Entomologen seltsamer Weise übersehen zu werden trotz der auffallenden Sculptur und Behaarung der Flügeldecken, denn in den Catalogen zweier Sammler aus Ajaccio finde ich den *Atronus* nicht angestrichen und doch sendet mir H. Manès ein Exemplar unter einer Menge anderer unbestimmter Käfer. Überhaupt sind unter diesen unbestimmten Käfern einige sehr interessante, z.B. ein *Adelops*, jedenfalls noch unbeschrieben, einige sehr auffallende *Scydmaenus*-arten,

ein sehr ausgezeichnetes *Ptilium* (oder *Panaphantus?*). Die übrige Sendung von H. Manès enthält diesmal nicht viel neues für mich wohl aber ein sehr schönes Tauschmaterial so z.B. freut es mich sehr, Ihnen ein Stück des prachtvollen *Pachypus cornutus* geben zu können. Leider sind viele Stücke der Sendung durch unsauberes Aufstecken und zaunpfahlähnlichen Nadeln fast gänzlich unbrauchbar. Als grosse Seltenheiten dieser Sendung möchte ich erwähnen *Hydaticeus Leander*, *Pachypus cornutus* ♀ und *Xanthochroa Raymondi*.—Es bleibt mir noch übrig, über den Erfolg meiner Pfingstexcursionen um Liegnitz zu berichten: Am 15^{ten} Mai war ich in Schönborn, fing aber des schlechten Wetters wegen nichts von Bedeutung, am 16^{ten} ging ich mit meinem Bruder an das Katzbachufer oberhalb Tivoli: die schönen Uferwiesen waren vollkommen todt, hingegen sammelten wir durch Abgiessen der Ufer unter vielen *Tachys*, *Bembidien*, etc., einen *Trechus longicornis*; am 17^{ten} siebte ich eine halbe Stunde am Eisenbahnteich und fand *Hygronoma dimidiata*, 1 *Flyobates nigricollis*, 1 *Hylastes Trifolii*; am 18^{ten} machte ich mit Dr. Joseph die Excursion in die Hessberge, wobei es uns nicht gelingen wollte Sie zu treffen; in dem Graben oberhalb Schlaup fanden wir *Agabus guttatus* hf., *silesiacus* hf., *chaleonotus*, *paludosus* s., *didymus* 2 Ex., *Hydroporus nigrita*, *halensis*. Durch diesen Fang aufgehalten kamen wir erst gegen 11 Uhr in den Buschhäusern an und stürzten uns sofort in die Saugruben, doch war trotz des eifrigsten Klopfen und Kötschern's auf den schönsten Sträuchern und Wiesen nichts Besonderes zu fangen; im Bache konnten wir nicht suchen, weil der Müller die Mühle arbeiten liess und folglich sehr viel Wasser im Bache war; das Aussieben der Weiden oberhalb der Mühle war fast gänzlich resultatlos, ich fing ein *Cephennium thoracicum*, 1 *Acalles Lemur* und einige *Scydmaeniden*. Darauf verfolgten wir den Bach oberhalb der Mühle und gingen dem rechten Arm des Baches nach: dieses feuchte Thal zeigte sich ergiebiger, doch konnten wir der vorgeschrittenen Zeit wegen nicht lange dort verweilen. *Telephorus paludosus* war nicht selten, ausserdem fing ich *Philonthus intermedius* und 2 *Amphicyllus globiformis*. Schon um 3/4 5 Uhr mussten wir aufbrechen weil der Zug nach Breslau schon um 3/4 7 von Brechelshof

abfährt Im Allgemeinen war der Mangel an Käfern im Gegensatz zu dem früheren Reichthum in den Hessbergen ungemein auffallend. Nachdem Dr. Joseph abgefahren war, ging ich nochmals in den Brechelshofer Park zurück, wo ich eine alte Pappel fand, in deren Mulm eine kleine gelbe Ameise (*Lasius flavus*?) sich befand; hierunter fand ich *Euplectus gracilis* und 2 *Symbiotes pygmaeus*; letzteres war für meine Sammlung neu.—Von den hiesigen Entomologen lässt sich nicht viel berichten; Letzner ist während der Pfingstfeiertage nicht auf Excursionen gewesen, Dr. Joseph will während der grossen Ferien mit mir einige Tage aufs Riesengebirge gehen und fährt im August nach Paris.—In der Schachtel steckt auch noch die *Homalota alpestris*, die sie bei mir vergessen hatten mitzunehmen.—Jetzt leben Sie wohl, hoffentlich erfreuen Sie mich bald durch einen Brief!

Ihr freundschaftlich ergebener

EUGEN SCHWARZ.

E. A. Schwarz an G. Kraatz

[ohne Datum (1869?)]

Geehrter Herr Doctor!

Wenn es einerseits nicht zu leugnen ist, dass ich sehr unrecht daran gethan habe, Ihnen bis jetzt nicht zu schreiben, so ist andererseits mindestens ebenso unzweifelhaft, dass Entschuldigungen an der Sache selbst nichts ändern werden und dass es also am besten ist, mich sogleich in medias res zu stürzen. Um zuerst die Geschäftsangelegenheiten zu ordnen, komme ich zuerst auf die Ihnen geschickten 4 Thaler; hierbei hatte ich in der Eile vergessen auf der Postanweisung das Nöthige zu vermerken: 2 Thaler davon, sind von Letzner pro 1869 und 2 Thaler von mir entweder pro 1868 oder 1869; ich weiss nämlich nicht ob ich für 68 schon gezahlt habe oder nicht. Was die Bembidien betrifft, so lebte ich der festen Überzeugung, dass Sie diese Sache längst vergessen hätten; es thut mir leid, dass ich Sie hierin habe so lange warten lassen und bitte, mir die Schachtel bei Gelegenheit nebst Rechnung zu schicken.—Seitdem ich auf eignen Füssen stehe, ist mein Geldbeutel eher dünner als dicker geworden und ich kann vorläufig an Bücherkäufe weniger denken als je; obgleich mir hier die Bibliothek des schlesischen Vereins

für vaterl. Cultur zu Gebote steht und mir Dr. Joseph mit grosser Freundlichkeit seine Bibliothek zur Disposition gestellt hat, so ist mir doch der Mangel an eigner entom. Literatur sehr drückend. Vorläufig aber kann ich, wie gesagt nicht daran denken mir grössere ent. Werke wie z.B. die Naturgesch. d. J.D. zu kaufen. Hingegen wäre ich nicht abgeneigt noch eine Partie Sareptaner zu kaufen, vorausgesetzt, dass ich solche zu einem billigen Durchschnittspreise erhalten könnte.—

Um nun meine entom. Erlebnisse während des verflossenen Winters zu erzählen, so muss ich vor Allen mein Bedauern aussprechen dass ich bei meinem Scheiden von Berlin mich von Ihnen nicht empfehlen konnte; als ich eines schönen Tages zu Ihnen gehen wollte erfuhr ich zu meinem grossen Erstaunen, dass Sie nach der Türkei abgereist wären. In Breslau häuslich eingerichtet machte ich zuerst die genauere Bekanntschaft mit Dr. Joseph, da wir uns früher nur sehr flüchtig kennen gelernt haben. In Dr. Joseph's ziemlich bedeutender Sammlung hatte ich vor allen Gelegenheit, das wirklich kolossale Material an Höhleninsecten zu bewundern, von denen ich einen Theil noch mit habe aufkleben helfen. Besonders interessant sind die Reihen von *Sphodrus* wobei man die Übergänge von *Sph. Schreibersii* und *Schmidtii* sonnenklar erkennt, ganz abgesehen von einigen Schaufuss'schen Arten, welche mehr oder minder nur einzelne Formen des *Schreibersii* sind (z.B. *Sph. Erberi*); in gleicher Weise zeigen die *Anophthalmus* eine ausserordentliche Neigung zur Variation. Dr. Joseph ist meiner Überzeugung nach der einzige der seinem Material nach im 'Stand' ist durch eine Monographie jede Artenmacherei bei *Anophthalm.* und *Sphodrus* abzuschneiden. Fast noch schönere Sachen als in den Grotten selbst hat Joseph in den Vorhallen derselben aus Laub und Erde gesiebt z.B. einen *Scydmaeniden*, den ich zur Gattung *Cephennum* stellen möchte, aber 3 Mal so gross wie *C. thoracicum*; am meisten imponirt mir ein kleiner Rüsselkäfer von der gewöhnlichen Höhlenfarbe aber mit deutlichen Augen. Von seinen auf den Krainer Alpen gesammelten Käfern fiel mir *Lixus cylindricus* auf, ferner *Carabus montivagus*; beide waren neu für die deutsche Fauna. Die anderweitige Sammlung Dr. Joseph's ist weniger erfreulich, so weit ich dies beurtheilen konnte,

wimmelt es darin von falschen Bestimmungen. Herrn Letzner fand ich ebenso verschlossen wie früher; man kann nur des Sonntags zwischen 11 u. 12 Uhr zu ihm gehen und wird um Punkt 12 Uhr herausgeworfen, dennoch habe ich den grössten Theil seiner an schlesischen Käfern überreiche Sammlung genau durchsehen können; ein Umstand fiel mir dabei auf: Letzner steckt nämlich fast sämtliche Käfer ohne jede Patriaangabe in seine Sammlung, was um so bedenklicher ist, da Letzner auch sehr viele nichtschlesische, deutsche und europäische Arten besitzt. Sehr überrascht war ich bei Letzner eine ausgezeichnete ent. Bibliothek vorzufinden, nur borgt L. nichts davon weg. Letzner arbeitet übrigens an einer schlesischen Fauna die sehr voluminös zu werden verspricht und entschieden für die deutsche Fauna viel Neues bieten wird, so hat z.B. L. für Schlesien 85 Apionen verzeichnet darunter einige von Thomson beschriebene.

Dagegen arbeitet Letzner ganz entschieden dem Bestehen der ent. Section der schlesischen Gesellschaft für vatr. Cultur entgegen, wie ich Ihnen später einmal erzählen will; die Sitzungen der Section sind ohnehin äusserst spärlich besucht; ausser Dr. Joseph ist nur Dr. Wocke und Dr. Schneider (N.B. Schneider hat die *Euryusa Wockii* an Dr. Joseph gegeben und dieser behauptet es wäre keine *Euryusa*) und ich anwesend. Dr. Schneider hat sich von der Entomologie zurückgezogen und sammelt vorläufig Brandpilze; wie lange ist noch nicht ausgemacht; vielleicht kehrt er noch einmal zur Entomologie zurück, da er alle 5 Jahre etwas neues zu sammeln anfängt.—Zu einigen kleineren Käfersammlern bin ich aus Neugierde gegangen habe aber nur mehr oder minder verlauste Sammlungen mit dicken Nadeln, Anthrenenlarven, etc., gefunden; dafür quälen mich aber diese Leute entsetzlich, indem sie mir grosse Kasten voll schmutziger Käfer zum Bestimmen aufdrängen.—Meine entomol. Studien lassen sich dahin zusammenfassen dass ich vor Weihnachten die Otiorhynchiden von Seidlitz vorgenommen habe und mich bei dieser Gelegenheit in die Systematik der Rüssler etwas eingearbeitet habe; die Artenbeschreibung bei Seidlitz hat mir weniger gefallen, indem einzelne Beschreibungen fast nur aus Vergleichen mit anderen Arten bestehen ohne etwas Positives zu bieten; das Buch wimmelt übrigens von sinnentstellenden

Druck- und Schreibfehler; nach Weihnachten habe ich mich mit Halticiden beschäftigt und mich dabei über Allard geärgert, der in der Beschreibung oft das wieder aufhebt, was er in der Diagnose gesagt hat. In Joseph's Sammlung fand ich übrigens eine unbeschriebene *Podagrica*, der *fuscicornis* nahe stehend, welche aus dem Innern Russlands stammt, und die ich Ihnen gelegentlich mittheilen werde.—

Was Excursionen anlangt, so bin ich mit Dr. Joseph im Herbste einige Mal bei Breslau sammeln gegangen; eine projectirte Winterreise nach dem Riesengebirge kam leider nicht zu Stande, sondern nur zwei Spätherbstexcursionen in die Vorberge bei Waldenburg und Jauer, die sehr erfreuliche Resultate lieferten. Eine interessante Beobachtung machte ich dabei: in einem Bache bei Jauer leben *Hydroporus platynotus* und *ovatus* ziemlich häufig; diese beiden so nahe stehenden Thiere haben doch sehr verschiedne "moeurs"; hebt man nämlich einen der halb im Wasser liegenden Steine auf, so schwimmt *H. ovatus*, der im Wasser prächtig roth aussieht, schnell fort, während *H. platynotus* im Vertrauen auf seine unscheinbare mit den schwarzen Basaltsteinen übereinstimmende Farbe, unbeweglich bleibt, so dass man ihn sehr leicht übersieht; auch stellt er sich lange Zeit tod, wenn man ihn aus dem Wasser nimmt. Während der Weihnachtsfeiertage was es so warmes Wetter dass ich bei Liegnitz einige Excursionen machen konnte, wobei ich unter andern *Erirhinus Maerkelii* erbeutete. Während der Osterferien habe ich mit Gerhardt sehr fleissig bei Liegnitz gesammelt und hauptsächlich nach dem neuen *Lathrobium Letzneri* Gerhardt gesucht, dessen Beschreibung Sie wohl schon in den Händen haben werden, und auch in ziemlicher Anzahl erbeutet, wobei das überraschende Resultat zu Tage kam, dass *L. Letzneri* nächst *fulvipenne* das häufigste *Lathrobium* bei uns ist; viel seltener ist *L. boreale* und noch seltener *L. elongatum*. In meiner Sammlung fand sich übrigens eine ganze Reihe des *L. Letzneri* aus Magdeburg vor. Während dieses Sommers denke ich das Riesengebirge gründlich zu exploriren, da die neue Gebirgsseisenbahn eine Excursion in das Hochgebirge zu einer Sonntagspartie gemacht hat.—Durch Tauschverbindungen hat meine Sammlung einen bedeutenden und theilweise ganz unerwarteten Zuwachs

erhalten; erstens traf von Bugnion eine grosse Kiste Alpenkäfer ein, worunter *Catops Bugnioni* Tournier (beschrieben in den *Annales d. l. Soc. de F.* von 1868 od. 69) hervorzuheben ist. Eine zweite sehr lohnende Tauschverbindung erhielt ich auf folgende seltsame Weise: Wie ich Ihnen früher mitgetheilt habe ist mein älterer Bruder leider brustkrank geworden und musste den Winter über nach dem Süden gehen und zwar nach Ajaccio auf Corsica. Natürlich unterliess ich nicht, ihn entomologisch auszurüsten. In Ajaccio machte mein Bruder die Bekanntschaft eines dort einheimischen Entomologen, welcher mit mir in Correspondenz und Tausch getreten ist, trotz der mannigfachen durch die weite Entfernung verursachten Schwierigkeiten; ich habe dem Corsikaner bereits 2 Sendungen gemacht und schon selbst im Februar eine bedeutende Zusendung Käfer zum grössten Theil corsikanische erhalten, nicht weniger als 200 für mich neue Arten, worunter viele, die Sie sogar als nicht ganz unbrauchbar erklär en würden. so vor allen 3 Stück des *Pachypus cornutus* ♂ und hauptsächlich ein ♀ dieser Art; ausserdem unter andern: *Carabus Genei*, *Pterostichus ambiguus*, *Nebria Lareynei*, *Harpalus incisus*, *hirsutulus*, *ovalis*, *Bellieri*, 4 Arten *Percus*, *Agabus cephalotes*, *Hydroporus discretus*. (N.B. Der Hyd. den ich von Ihnen als *discretus* erhielt ist jedenfalls nicht richtig bestimmt), *Lareynei*, *limbatus*, *6-guttatus*, einen neuen *Sunius*, *Micropeplus fulvus*, *Merophysia formicaria*, *Parnus striatellus*, *Triodonta eribellata*, *Anomala rugulosa*, *Asida corsica*, *carinata*, *Pimelia Payraudi*, *Pachybrachys cinctus*, *Goniocтена lineata* u.s.w.; viele Arten darunter in Mehrzahl.—Eine zweite Sendung aus Corsika werde ich in nächster Zeit erhalten und im Mai wird mein Bruder mit den unter Anleitung des erwähnten Sammlers gesammelten Käfern—mein Bruder schreibt von mindestens 20,000 Stück—hier eintreffen.—Einer meiner Vettern hat mir aus Syrien wieder einige Käfer mitgebracht worunter am auffälligsten ist eine ziemlich grosse hellbraune *Elaphocera*, die ich Ihnen, falls sie sich nicht als europäisch entpuppt, überlassen werde.—Ihr Verzeichniss der deutschen Käfer hat mich sehr interessirt; ich vermisse übrigens bei flüchtiger Durchsicht: *Exocentrus Clarae* resp. *punctipenne* (bei, Liegnitz an Eichenzäunen) und *Thyamis Reichei* (von Gerhardt bei Liegnitz gefangen).—

Zum Schluss noch eine Angelegenheit: Ich habe Letznern beredet, Mitglied der société ent. d. Fr. zu werden; da er nun in Paris kein Mitglied kennt, so hat er mich gebeten, Ihnen die Sache vorzutragen mit der Bitte, falls es Ihnen nicht viel Mühe kostet das Nöthige zu arrangiren.—

Schliesslich bitte ich Sie um Entschuldigung, dass ich Ihnen einen so langen Brief noch dazu in meiner miserablen Handschrift schicke.

In der Hoffnung, dass Sie mir auf die oben angedeuteten Fragen gelegentlich Antwort zukommen lassen verbleibe ich

Ihr freundschaftlich ergebener

EUGEN SCHWARZ.

United States Department of Agriculture,
Division of Entomology,
Washington, D. C. January 21, 1889

My dear Mr. Sherman,

I cordially thank you for the specimen of *Hister planipes* and that of *Bactridium cavicolle* which you kindly sent me and which were correctly named.

The reprint of LeConte's & Horn's "Classification of the Coleoptera of North America" is now ready and you can obtain a copy for \$2.66 (which includes postage) by addressing Dr. Geo. H. Horn, 874 North 4th St., Philadelphia, Pa. Try by all means and bring this sum up because without the *Classification* the study of our Coleoptera is impossible.

Yours sincerely,

E. A. SCHWARZ

United States Department of Agriculture,
Division of Entomology,
Washington, D. C. Jan. 30th, 1890

Dear Mr. Sherman,

Your favor of the 19th and the specimens came safely to hand. Many thanks for the specimens of *Agabus obtusatus* which were quite acceptable. The others are herewith returned and I enclose that list of them. No. 2 (*Mycetochares fraterna*) is not

common, in fact all species of *Mycetochares* are very little seen in collections. They live in dry-rotten wood and crawl about during the night. To fill up the box I added a few western species which are possibly new to you.

The *Lathrobium abdominale* in my last list should be changed to *L. ventrale*. Mr. Schmidt is still at 290 3rd Ave., Brooklyn, but since the old man does not understand English it is quite likely that he will not write to you. If you want boxes order them through his son, Prof. J. B. Smith, Rutgers College, New Brunswick, N. J., but you will not get any before May since several hundred boxes have been ordered by other parties.

The Washington Entomologists are crawling about again.

Yours sincerely

E. A. SCHWARZ

Washington, D. C.

Feb. 26/90

My dear Mr. Sherman,

I sincerely thank you for your kindness in presenting me that specimen of *Euplectus*. I have most of the species described by Casey and LeConte but nothing similar to your species. It is probably undescribed. Your last box came safely to hand and I returned it yesterday, the list is inclosed and in the space made empty by taking out the *Euplectus* I put two western Staphylinidae. No. 35, (*Stenus ageus*) is not common in my experience. The genus *Stenus* is a difficult one anyhow and rendered much more difficult by Capt. Casey's poor paper thereon. The genus *Cafius* differs from *Philonthus* in the structure of the hind tarsi, the first joint being but little longer than the second. *Cafius* has always on the thorax two dorsal series composed of many punctures and the lateral punctures are also numerous; in most *Philonthi* there are but few lateral punctures and not more than 6 punctures in the dorsal series. *Cafius consobrinus* must be a clerical slip for *C. sobrinus*; you can readily recognize this by the yellow apical border of the elytra. You can get a good and suitable lens for about 4 or 5 dollars but only in Philadelphia or New York. There is none to be had here in Washington and I suppose still less in your city. Such lens is of course

not so clear as a Tolles triplet but almost as strong. I had lately a number of locality labels printed and as I had just a column to spare I printed Peekskill labels. I send you herewith some and can send many hundreds more if you find them convenient.

Yours sincerely,

E. A. SCHWARZ

Washington, D. C., March 26/90

Dear Mr. Sherman,

I cordially thank you for sending me your only specimens of *Philonthus micans* and *Teretrius americanus* but since I have both and since I wrote you only that I would like to have specimens thereof I decline to deprive you of them and they are herewith returned. Your other specimens are herewith returned with list of names. There are several rare ones among them: × - *Bryaxis lunigera* ♀; the ♂ is very rare and the female is still rarer. I have a few males but no female and should be very glad to get it from you as well as the *Mycetochares*. 9-914, *Nemosoma parallelum*, is tolerably rare; 9-900 is a strictly maritime species but not rare in the more northern Atlantic States; 9-918, *Thysanocnemis fraxini* is not often seen in collections and lives in the seeds of *Fraxinus*; 8-783, *Trimium globifer*, is also rare and I have only one specimen.

You may send me everything for determination excepting large western *Tenebrionidae*, *Cerambycidae* and the larger *Carabidae*; if you send species of such genera as *Melanotus*, *Macrops*, *Anthonomus*, *Atomaria*, *Baris*, etc., they will in most cases be returned unnamed since these genera are still in great confusion.

For mounting specimens for my collection I use a mixture of Bleached Shellac Varnish and common Shellac Varnish, both being sold in small vials. Formerly I used only Bleached Shellac Varnish which is perfectly white but I found that it has no adhesive powers and was compelled to add about one-third of common Shellac Varnish. Since an exceedingly small quantity of this mixture is sufficient to hold the specimens firmly to the paper, the dark color of the mixture does not interfere with the

clear appearance of the mounted specimen. For mounting duplicates a gum soluble in water is absolutely necessary and I use since many years Spaulding's glue with great satisfaction. In remounting duplicate specimens I throw the paper in cold water and wait until the specimens float off and are a little softened; then I take them carefully out of the water and place them on wet blotting paper which takes off the still adhering particles of the glue. Specimens received dry in papers I simply throw in cold water, smaller specimens are sufficiently relaxed in from 5 to 10 minutes (according to the temperature of the water) but large specimens e.g., *Eleodes*, etc., must be left in the water for half a day or so.

Yours sincerely,

E. A. SCHWARZ

P. S. Please direct in future your letters to my private quarters.

230 New Jersey Ave., Northwest.

United States Department of Agriculture,
Division of Entomology,
Washington, D. C. April 9th, 1890.

Dear Mr. Sherman,

The post office has a right to open 4th class mail matter and we should not be astonished, therefore, that once a while a package of insects suffers by such inspection. I have had several times occasion to mourn the loss of valuable specimens from this cause.

I am very much obliged to you for the new *Mycetochares* and the female of *Bryaxis lunigera* and sincerely hope that you will be able to find additional specimens. I send you a male of the latter species and call your attention to the wonderful formation of the antennae in this sex. I also add three other Pselaphidae and hope they may be new to you.

I return herewith your specimens which this time are, in some instances, determined with a ?, viz., in the genera *Batrissus* and *Hydroporus*. The former genus has fallen into great confusion by the reckless way in which Capt. Casey has described "new" species. The genus *Hydroporus* has always been a difficult

genus and every large collection contains many doubtful and unnamed specimens. I have No. 8-604, *Coelambus* and believe it to be undescribed; No. 7-397 belongs to a group which is still in confusion and I think that your specimen I is only a strongly pubescent form thereof. No. 7-1032 a *Bryaxis divergens* is not often seen in collections but may be not rare with you; you can recognize it by the striae on the first abdominal segment which are approximate, divergent and arise from a rounded tubercle. No. 9-929, *Philonthus thermarum*, is a rare species and I have hitherto seen specimens only from Washington, D. C.; 8-587, *Hydroporus difformis*; this I have not in my collection and I would be glad to have a specimen. Try and find the ♂ which has the antennae thickened at middle. No. 7-392 this was formerly well known in our collections as *Hydroporus signatus* Mann., but Dr. Sharp has omitted this name in his Monograph for reasons not stated by him and the species has probably another name. No. 7,1032d had been lost when I received the box, but it may be still at the bottom of the box. The large *Euplectus* which I could not name in your previous box is in all probability only an exceptionally large *E. confluens* with an unusually large head.

I also send you the rest of the locality labels.

No. 4 of the Proceedings of the Ent. Soc. of Wash. will be out before the end of the month. This number will cost us about \$180.00 and since we have only \$75.00 in our treasury we will have to contribute heavily. It contains also my paper on *Myrmecophilus* Coleoptera and I hope that you will be able to make additions thereto since many common species of ants have never been properly investigated as toinquilines.

Yours sincerely,

E. A. SCHWARZ

Washington, D. C. October 27/91

Mr. H. C. Fall,

Dear Sir,

Your favor of the 20th inst. came duly to hand. I shall gladly name for you North American Coleoptera but I am afraid that you will find me of less assistance to you than such accomplished

Coleopterists as Dr. Horn and Mr. Blanchard. Still, I have also endeavored to make myself thoroughly acquainted with the literature on our Coleoptera and with the insects themselves. Of late years, however, I have paid attention almost exclusively to the Microcoleoptera of all families and somewhat neglected the families composed of larger forms. Thus, do not send me for determination any large Carabidae, Scarabaeidae, Buprestidae, Cerambycidae and especially no large Tenebrionidae. There are many Coleopterists who know these big things much better than I do. Even among the Microcoleoptera there are enough genera of which I know very little.

I do a great deal of determining for others and always make it a point to return everything that has been sent to me. If I am desirous of having a certain species for myself I ask my correspondents for a specimen or two provided they have duplicates. So, if you send me anything for determination I shall return the box as soon as practicable. Please address packages and letters: 230 New Jersey Ave. NorthWest.

Yours truly,

E. A. SCHWARZ

Selma, Ala., August 27, 1894

Dear Hubbard,

I am much obliged to you for your letter of the 24th which I found here this morning but I am greatly alarmed to learn that you have contracted such a bad case of malaria. I earnestly hope that you will have carried out by this time your plan to go to Virginia Beach or Cape May and that Mrs. Hubbard has been with you.

Since my last letter to you I did unexpectedly some observations on *Aleurodes citri* which occurs in great abundance on a little hedge of Cape Jessamine in the city of Baton Rouge. Its behavior on that plant is exactly the same as on the Orange in Florida but I succeeded in finding several enemies and notably a little black Coccinellid which appears to be identical with *Cryptognatha pusilla* Lec. This species is very rare in Florida (so far as I recollect) but common near Washington and could

be easily transported to Florida.—Mr. Morgan the Entomologist of the Louisiana Agricult. Exper. Station is a very nice fellow and if you had to go next winter or spring to California in your investigation of Orange insects you should by all means notify him and he would show you with the greatest pleasure all the Orange groves south of New Orleans. He is very anxious to make your acquaintance but you must by no means tell him that the Florida oranges are better than those from Louisiana, or that the Louisiana orange trees are badly kept.

During my trip in Texas I kept a sharp outlook for gopher holes but since I mostly travelled in the black soil region I did not see any. The Aransas peninsula with its sandy soil, its Live Oaks and other small oak shrubbery reminds one very much of Florida but the sand is only a couple of feet deep and underlayed by limestone rock. No one knows of the existence of a burrowing tortoise although there is a hole under every bush. This hole is, however, only about a foot deep and inhabited by a rabbit which is one of the greatest pests of this region and every cultivated spot is enclosed by a rabbit-proof fence.

Selma has greatly improved and increased since our stay here in 1880. The old St. James Hotel is closed and there is now near by a big bridge across the Alabama River. The latter is brim full at present and has overflowed all the low land on the other side of the river. The weather has moderated somewhat but it is raining constantly so that I cannot do any field work. I have written this to Mr. Howard and I hope he will consent to my breaking up this trip the main object of which I have accomplished.

Owing to the bad weather I have seen but few insects in the field. Only at Rockport I could not abstain from spending a few minutes at the beach of the bay. The beach is quite flat and the surf does not reach the shore; consequently there is no drift-wood etc. swept ashore, but a thin layer of ill-smelling, very fine sea-grass covers the shore for about 10 feet. On this grass there is a *Cicindela* in great number which I fail to recognize and under the grass I found a few beetles among them a species of *Pogonus*, different from that we found at the Great Salt Lake. The Aransas Peninsula is certainly a good and interest-

ing locality in April or May when everything is said to be in bloom.

I sincerely hope that you will look out for your health.

Yours ever

E. A. SCHWARZ

Hotel Albert.

Selma, Ala., September 1, 1894

Dear Hubbard,

Just returned from a trip to Pineapple (50 miles south of here) and on the point of returning north I receive your letter of the 30th ult. the contents of which greatly surprised me. Above all I can only repeat my sincere wishes that you soon get well again; secondly it is of course out of question that you must bring out your second edition of the Orange Insects Report under all conditions. I think you can accomplish this before the winter is over and then you are of course at liberty to resign your position or to make some other arrangement with the Department.

That Mrs. Hubbard has made herself at home in my rooms I learned already from a letter from Mr. Havenstein, and I hope she has, from an inspection of the rooms, seen how a bachelor's quarter is to be managed. I hope also that she got soon over her indisposition and that she has seen something of the Knights of Pythias.

I have myself a slight attack of malaria just now; I think it is that miserable Selma water with its horrid smell which did it but I shall get better as soon as I am on the railroad. All the countless Red bug bites which I got on this trip are breaking out and I am covered all over with bad sores. I intend to stay over at Mount Airy or Toccoa (north of Atlanta) for a day before returning to Washington; this will put me all right again.

Shall write more fully when I get back to Washington. I am of course greatly disappointed to know that I shall not find you there. My kindest regards to Mrs. Hubbard and to your father and brother and to all Detroit friends.

Yours ever

E. A. SCHWARZ

P. S. I hope you did not pay anything to Mr. Havenstein; my rent for August had been paid by myself.—Did you get my letter of the 27th?

Wash. D. C., Sept. 20/94

Dear Hubbard,

I intended to write to you every day but delayed it constantly because I do not know yet when I shall be able to get away from here. I have not done much work here since my return mainly for the reason that I had a pretty bad attack of the regular ague. I am over it now and my Red Bug sores have mostly healed but still suffer from utter lack of appetite. Your postal card has just come to hand, however, and I have made up my mind to leave here Sunday night (either at 7.10 or 10.40 P. M. I do not yet know which is the right train) or Monday morning 7.50 A. M. I shall stop at the Russell House, Detroit, and beg you to write me a note there how and where I shall find you.

I have, through several days, carried on a systematic search in my sleeping room for the lost diamond and regret to say that I have failed to find it. It is certainly not on the floor or under the bureau or elsewhere *on* some of my furniture but it may be somewhere *in* one of the drawers. I have given direction not to clean the room until every hope of finding the diamond has vanished.

Dr. Horn was here on Sunday and Monday; he regrets that he did not see you here and sends regards. Prof. Riley is said to have returned from Europe but has not yet made his appearance at the Department. Upon hearing of his return, Mr. Howard has escaped into the mountains of New York and will be absent until October 1st.

All my specimens I collected in the South and which I had packed in pill boxes have been eaten up by the rats in our office!!

I sincerely hope to see you and all your family in good health.

Yours ever,

E. A. SCHWARZ

P. S. I see that there is a vigorous correspondence going on between the Treasury authorities and our Disbursing Office over one of your bills for \$2.00 for express. I have been twice at the Express Office to straighten up the receipt but so far it had no effect. E. A. S.

Martinet House.

San Diego, Texas, May 19, 1895

Dear Hubbard,

I should have written to you long ago, in fact I am greatly ashamed of not having done so, but there is again the same old trouble and the idea of being suspected of carrying on a secret private correspondence with you while you are in the employment of the Department bears heavily upon me.

Of course I constantly thought of you and your family during this disastrous winter and when I passed through the dead orange groves of Louisiana on my way to Texas. West of Houston the Texan prairie is strewn with dead cattle and even the mesquite bushes are killed. Here in southwestern Texas there are no fruit trees to be killed but all the oleanders and the fine Mexican plants in the gardens have been frozen. There was two days fine sleighing here in February.

I am sent here into this miserable Mesquite and Cactus brush to investigate *Anthonomus grandis* which at present is so rare that it takes three men a whole day to find a single specimen. I wonder how I can investigate it under the circumstances except by waiting until it gets more numerous.

The country is by no means handsome, a waterless region without trees, slightly rolling, densely covered with a monotonous growth of Mesquite and Chapparal (4 or 5 species of Mimosa and a few other spiny bushes.) The intervals between the bushes are filled with a liberal growth of gigantic Opuntias, but owing to the drouth there is hardly any low vegetation. East and south of here there are prairies, at present looking very much like the desert west of Salt Lake City, Utah. The soil is however very fertile and this whole region would be a garden land if irrigation were possible. Still it is astonishing that in spite of the drouth (it rains here about five or six times a year) they are able to raise some corn, cotton and beans. Farther south, toward the coast, a great deal of grapes are now raised but down there they have extremely heavy dews which replace the rain. The climate is delightful and much more invigorating than that of Florida.

Regarding the work of Scolytids in Orange trees I would say that a good deal has been written on the food of the larvae of

Xyleborus and more especially *X. dispar* (pyri). All observers agree that the larvae are not lignivorous but there is some dispute regarding the nature of the real food which by old Schmidberger has been termed "ambrosia." Whether this consists solely of fermented sap or whether it is exclusively a fungus growth or a combination of the two is, to my knowledge, not yet settled. The natural history of the Platypus is by far less known. Did you get a male of the so-called Xyleborus rubescens from the Orange? This would be quite interesting because we would then be able to see whether your species is identical with the West Indian Shot borer.

It is too bad that I cannot be with you now and have a good talk with you but I hope to find you in Washington when I get back. By all means take this opportunity of visiting California and extending your knowledge of the orange culture. Take a good look at the country out there and I hope it will present a more beautiful aspect than this southwestern Texas which for reasons unknown to me they call "semitropical Texas."

Before leaving Washington I inquired of Dr. Stejneger regarding the precise locality of *Gopherus berlandieri*. He told me that only the type specimens were known and that these came from the valley of the lower Rio Grande. I made some inquiry here about burrowing turtles but there is unfortunately no one interested in natural history. I am told that they have a turtle that burrows like a mole, never coming to the surface, and Mr. Bront gave me the shell of a turtle which is said to burrow along the banks of the San Diego River (this has, however, never any water). I send it with this; please ascertain from Dr. St. what species it is. There are so many burrowing animals here that it is difficult to know which hole is a turtle hole.

I have never been in a country like this and the fauna is quite different from that I have collected at Columbus but the Coleoptera resemble in characters those found by Belfrage in Clifton Co., Tex. I presume the real "semitropical" portion of the fauna is confined to the Rio Grande Valley. I have of course picked up many Coleoptera but have not yet learned how to collect in this spiny region. The Mesquite seems to be very rich in insects and I wish you were here to study the insects of

the *Opuntias*. These are infested by at least 3 large species of *Acalles* and lots of other things. I have reserved for myself a duplicate set of the *Coleoptera* and send you herewith a tin box full of them. Another box I sent the other day to Mr. Haverstein. Open the same and see whether the specimens are all right.

Dr. Horn was in Washington early this spring and he told me that Mr. Merkl of New York got hold of that new *Nomaretus* of yours from N. C.; so I resolved to fix up that paper on *Nom.* for publication and have stolen all your notes. I wonder what you will say to this. The paper will be published in the next number of the *Proc. Ent. So. Wash.* now in press. You will see that I have greatly changed the table of species which we worked out last winter.

You do not write me how your father is going on, and how is your family.

I hope you have made yourself at home in the old quarters on N. J. Ave. The rent is paid to June 1st. and since I have to pay rent anyhow after that date you have only to pay for breakfast and lager beer (I wish I had a good quantity of the latter here) I think there is also a little whisky left.

My address will be for some time San Diego, Tex., though I am just about to go into the Nueces Valley for a week or so.

Yours ever,

E. A. SCHWARZ

San Diego, Texas, May 31st, 1895

Dear Hubbard,

I have just returned from a short trip to Laredo, where I had to go on account of a periodic trouble I have with my plate of false teeth, and find here your two letters of May 23rd and 24th. I do not like at all to hear the bad news regarding your father's health but since he got over his trouble once there is reason for hope that he may get over once more and attain the ripe age of 90 years in spite of his gangrene. In regard to Mrs. Hubbard's health I know she will speedily recover in the balmy air of southern Texas where the climate is certainly admirable. No telegram has as yet come from you announcing your departure from

Washington but at any rate I am afraid it will not "function," since traveling from here to San Antonio takes just as much time as from Washington to San Antonio. The slowness of the trains and the waste of time that pervades everything here reminds me of the olden Florida ways as we found them in 1875.

I shall seriously think of joining you at Los Angeles for a couple of weeks or so after about June 20th when I propose to close my work here. At the end of my work here I am contemplating a visit to the isolated cotton belt at Del Rio which is about 170 miles west of San Antonio on the road to El Paso and only about 800 miles from Los Angeles. On the other hand I think I shall feel a little tired out with field work and desirous of returning to Washington.

The longer I am in this spiny country the more I like it and I find that it possesses many peculiar charms especially away from the towns and where cattle, goats and sheep have not spoiled its beauties. There is quite a stretch of land along the banks of the so-called Taranehuas Creek only a mile distant from San Diego which is fenced to keep out the cattle on account of the numerous steep arroyos. This piece of land preserves all the severe beauty which in former years was spread over the whole southwestern corner of this State and I wish only you could see it. I am sure there is nothing like it in the whole of Arizona and California. In the dry arroyos which are all the way from 4 to 30 feet deep one can easily walk but except at rare intervals is it possible to make a few steps in the brush itself. I am utterly unprepared for an entomological exploration of this country and should have big boots and a thick leather coat and above all I should not be sensible to the spines of all sorts. At present whenever I step in one of the gigantic cactus or put accidentally my hands upon them I pause to extricate the spines whereas the Mexicans and old Texan settlers do not mind the spines in the least. Of course, the insect fauna of this section will be found to be rich and interesting although I shall bring home only a small fraction of the species that could be found here with due preparation. Before I left Washington there was a great talk at the Department about working up the fauna of Southwestern Texas, Townsend down at Brownsville proposing to publish a big

paper, and I was assured that all my things would be properly mounted. So all the uniques are in the boxes I send to the Department and I would feel sorry if some of them got lost.

It is extremely difficult for me to advise you what you could do for Coleopterology in southern Cala. Our collection does not contain a great deal from there and thus everything with an exact locality is welcome. If you go to Santa Monica on the sea coast you would of course have a good opportunity to make a collection of the maritime fauna and I feel quite sure that rare things can be found by digging in the sand. If you spend your Sundays in the mountains there is of course opportunity to collect anywhere. If there are any streams try and extract the Elmids of which I have no doubt several new species should be found there. I am anxious to obtain specimens of the Scolytid genus *Chaetophloeus*, a rather small, oval species of brown color with conspicuous erect spines. It should occur on or in small dead branches.

I am extremely pleased to learn that you finally obtained the imago of that Gopher Lepidopter and am very anxious to learn friend Smith's opinion. I feel quite certain that it is an undescribed species and upon your return from Cala. you should by all means go to work and write an appendix to your gopher paper. I seriously doubt whether the turtle shell I sent you will turn out to be a *Gopherus* and further whether *G. berlandieri* really occurs at San Diego. While going to Laredo I crossed a remarkable stretch of drift sand greatly resembling that at Squally Hook, Or. This sandy region is about 5 miles across and of a length unknown to me. The station Peña lies at the western edge of it and here I inquired of a burrowing turtle. The stage driver fortunately spoke English and he informed me that there was such an animal in that sand known to the English speaking settlers as the "upland terrapin." I should not wonder if this is *G. berlandieri* although the Peña region is not exactly the lower Rio Grande valley. At Laredo the soil is either hard clay or gravel but there is no one in the city that could give me any information. The *Catops* from the gopher holes in Florida is a new species and if you have now ♂ and ♀ among them, it can be described.

Glad to hear that you do not raise any row about that *Nomaretus* paper; *N. hubbardi* is undoubtedly a good species; I sent a couple to Dr. Horn who affirms its validity.

I was very much afraid myself that the big *Acalles* would come to life again, and opened here every box before sending them to Washington. The trouble is that my cyanide I used during the first two weeks of my stay was old and poor.

Your discovery of the ♂ of that Orange *Xyleborus* is most welcome news to me; I shall at once examine the specimens upon my return to Wash.; please let me know where you put them.

I shall write you again shortly, but I can hardly expect to get an answer from you soon, since I expect to do some travelling now. However a letter will reach me about June 15th at the Menger Hotel, San Antonio.

Yours ever,

E. A. SCHWARZ

San Diego, Texas, June 1st, 1895

Dear Hubbard,

I fortunately kept my letter of yesterday in the expectation of getting a telegram from you but I got instead your letter of May 27th. I do not know whether or not I should feel sorry that you have abandoned the California trip but I think that under these circumstances you did right not to go.

I have been advised about that Rhinewine and beg you to at once open one of the cases and drink a bottle to the health of your father; and further to accept one case as a present from me to be sent to your folks at Detroit. Five cases contain a light white wine while the sixth contains a dozen bottles of the famous red Rudesheimer wine which is quite expensive (\$1.05 per bottle).

Very much pleased to learn about Smith's determination of the Gopher Lepidopter and more especially that it really belongs to *Helia*.

I sent to Dr. Horn all our *Seymnus* but he refused to have anything to do with the *Smilias* and other minute *Coccinellids*. Coquillett's new *Smilia* is by no means a very striking species but I shall describe it as well as various other undescribed species in

our collection upon my return to Washington. There is a true *Pentilia* in our collection from Biscayne Bay. That Dr. Horn refuses to recognize the genus *Vedalia* and reverts to the old genus *Novius* curiously coincides with Dr. Weise's (Berlin) paper on *Coccinellidae* in which he erects a new genus, *Neove-dalia*, upon *V. cardinalis*. You will find Weise's paper either in the latest *Berliner* or *Deutsche Entomologische Zeitschrift*.

An addition to the literature on Gopher insects is furnished by Mr. Lewis of England, the specialist in *Histeridae* and famous traveler in Japan who published some time this spring in the *Entomol. Monthly Magazine* a letter from old Dr. Hamilton on your and Dr. H.'s Discoveries. The letter does not contain, however, anything new.

A letter just received from Mr. Howard changes considerably my plans for the next two weeks. He requests me to run down to Brownsville to see how Townsend is situated there. Although nothing can come out of this trip in the furtherance of this *Anthonomus grandis* investigation I am exceedingly pleased to have now the opportunity of seeing what they call here the "paradise of semitropical Texas" where they raise cucumbers and watermelons in December and where the rattlesnakes grow as thick as a man's thigh. I only dread that stage ride of 110 hours but while I was at Alice the other day I inspected the stage and found it quite comfortable. So I have just repacked my traps and shall commence this trip tomorrow (Sunday) at 3 P. M. to arrive at Brownsville next Tuesday in the evening. I expect to be out of sight for 8 or 9 days but letters will reach me up to June 10th at the St. James Hotel, Corpus Christi, Tex.

I learn from Mr. Chittenden that Henshaw's latest Supplement to his Check List of N. A. Coleoptera is published; please order for me 4 copies from Mr. E. T. Cresson of Philadelphia.

I sent yesterday another box to Mr. Havenstein containing various pill boxes with some Coleoptera; please take charge of the same.

If I remember correctly, there was when I left some extra good whiskey left in a bottle in the closet of my parlor. I hope you have found it.

If all goes well I hope to see you in Washington within the next four weeks.

Yours ever,

E. A. SCHWARZ

Brownsville, Tex., June 5, 1895

Dear Hubbard,

After an uninterrupted trip of 40 hours by stage I managed to reach this place. The road from Alice is less interesting than I anticipated, for instead of striking straight down through the country it proceeds in a southeasterly direction until it reaches, about 50 miles from Alice, the open prairie and salt marsh region and follows the same to within about 50 miles east of Brownsville. Then follow about 45 miles of Mesquite brush and chapparal until finally one reaches the rich black soil of the Rio Grande valley which with its numerous trees, its rivers, swamps, exuberant vegetation etc. forms the strongest possible contrast with the San Diego region.

Prof. Townsend is located here and inhabits a nice little house with an entomological work room etc. but he is unfortunately not a field entomologist and does not know how to collect in this region which must be an entomol. paradise. I wish I had been here since last April. But then the cotton districts are several miles distant from the city and can hardly be reached without wagon. I expect to stay here three or four days and then return to Alice and Corpus Christi.

Yours ever

E. A. SCHWARZ

Menger Hotel.

San Antonio, Texas, June 18, 1895

Dear Hubbard,

I find here your letter of the 6th from which I see that when you wrote it you had not yet received my letter of May 31st or June 1st. I think I wrote you also from Brownsville. During my short stay at the latter place I had the opportunity of visiting for a couple of hours the semitropical forest along the lower Rio Grande and most sincerely regretted that you were not with

me. We must under all circumstances make a coleopterol. expedition into the depth of this fairy land which so far as I could see beats everything I have hitherto seen in richness and variety of insects. The edge of this forest resembles wonderfully your prairie land at Haw Creek; the forest itself is mainly palmetto, interspersed with Celtis, Ash, numerous Mimosaceous trees and various other trees entirely unknown to me. The *Erythrina* grows there about 30 feet high. The whole is interwoven with a tangle of vines into a delightful rather dense jungle where unknown species of Coleoptera can be found by the score in less than no time.—After my return from Brownsville I visited for the third time the Nueces River Valley north of Corpus Christi and would by now be on my way home but for the fact that I have to investigate the watermelons at Pepper Grove which must be somewhere near Galveston. So I shall lose at least two days but expect to be in Washington by the 22nd or 23rd. It is extremely hot here, much warmer than farther south. Hoping to find you in good health etc.

Yours ever

E. A. SCHWARZ

Washington, D. C., Dec. 9/96

Dear Hubbard,

I felt greatly relieved to learn from your letter of the 4th that you had finally started on your Arizona trip, and from your letter from New Orleans which I just received I see that you will be soon in a climate where there are no blizzards and where even the Ghila monster enjoys the midwinter temperature. I feel confident that under the influence of this congenial climate the microbes in your lungs will soon get still smaller and scarcer and finally disappear altogether. I hope you will let us know at once where and how you got settled at Tucson and also what in the line of boxes, bottles, pins etc. etc. we can send you. Do not exert yourself too much at first, take it easy but spend as much time as possible outdoors. Remember also that should you get short of funds you need only to telegraph to me.

I wrote you a lengthy letter to Detroit which seems to have missed you. It contained an abstract of the entomolog. news of

the past few weeks and should it not reach you I shall set up another epistle.

Since I wrote that letter nothing of any consequence has transpired here. Last Thursday we had the regular meeting of the Entom. Society with the usual tremendous amount of talking. There was also the election of officers for 1897 and you have been reelected as Vice President.

I shall write more fully as soon as I hear from you. I wish I could be with you at this time.

Yours ever

E. A. SCHWARZ

Washington, D. C. Dec. 17/96

Dear Hubbard,

This morning I mailed you a short note (besides forwarding two letters) inquiring from news from you but upon returning home from the Office I am delighted to find your most welcome and interesting letter of the 11th. To be sure you do not write a word about the state of your health, nor how the Arizona climate agrees with you but since you are looking after the insect fauna I take this to be a good sign. Do not be discouraged at not finding any insects now; you must remember that you are in midwinter in an arid region, and, very probably, the immediate surroundings of Tucson are unfavorable. Moreover in such regions only close acquaintance with the locality will enable you to find the insects if there be any. *Larrea tridentata* should have some Coleoptera peculiar to it though none (except *Aphodius larreae*, in the blossoms) are on record.—The *Aleochariui* in fresh dung are probably not different from those (*Aleochara bimaculata* etc) we find here under the same conditions. The “little hairy globular Tenebrionid” must be an *Edrates* but the small species *E. rotundatus* is known only from Colorado and Wyoming whereas the species known from Arizona, *E. ventricosus* cannot be called “small.” It is as big as a potato beetle.—The Cerambycid in Sunflower stems is probably nothing but *Hippopsis lemmiscata* but is also likely to be a *Dorcasta* or *Spalacopsis*. If you send a few stems we will try and breed the imago.—*Thyridopteryx townsendi* Riley is as far as I remember

now a MS. name but I shall hunt the subject up tomorrow.— Small Hydropori from Arizona are liable to be good species especially if they are of ovate or broadly-ovate shape. Of large Parnidae only one species *Helichus productus* is known from Arizona and this is probably your species.

Yours ever,

E. A. SCHWARZ

Washington, D. C., Dec. 21, 1896

Dear Hubbard,

I expected to get a letter from you to-day and sure enough when I came home from office I found your letter of the 16th with two packages. It is extremely gratifying to me to learn that you are satisfied with the state of your health and hope that the improvement will go on steadily. I opened the boxes and also the small pill box since I heard something crawling in it. I found that the *Bruchus* had come to life again and had done some damage to the tarsi of the *Helichus* (*productus*) and *Elmis* (*similis*). I shall mount tomorrow morning the contents and report to you at once. I have taken leave for the rest of the month but shall go to the office tomorrow to send you boxes, franks, paper etc. and to give Pergande the Coccid and the ants. I am sorry that you have to work so hard to get a few things but I suppose you do not need to stay at Tucson longer than it is necessary to get acquainted with the aspect of the country.

Referring to your letter of the 11th I would say that the *Thyridopteryx townsendi* Riley has never been described and the imago has not yet been bred although we had at several occasions living larvae here in Washington.

Insects of all orders are reported to be plentiful on *Larrea* when this plant is in blossom, and Coquillett informs me that he always finds the Otorhynchid genera *Ophryastes* and *Eupagoderes* sitting on the stems.

Your mention of adobe houses reminds me of the fact that Cockerell found this spring, while occupying the seat of his adobe-built backhouse at Merilla, a specimen of a Meloid, which is either *Hornia* or a genus allied to it. I also recall that Mons.

Dugès of Guanajuato, Mex. found the only specimens of his genus *Leonia* (allied to *Hornia*) in an adobe wall. So if you find a deserted adobe house, look out for *Anthophora* colonies in the walls.

Pergande has become nearly crazy in consequence of the study of your *Xylococcus* and swears now that the family *Brachyscelidae* has no existence whatever. Figures of the birch *Xylococcus* are now being made and your paper will be sent to you shortly to make the necessary alterations.

You remember that Cerambycid larva producing the rattlesnake-like noise we discovered in a pine stick at our house? One of these larvae has been good enough to transform to imago; it is the common blue *Callidium antennatum* which you would be able to find also in the pine woods of Arizona.

I have read with intense interest your letter of the 16th and shall reply to it tomorrow when I have mounted the insects.

Yours ever,

E. A. SCHWARZ

Washington, D. C., Dec. 29, 1896

Dear Hubbard,

Above all I most sincerely wish that with the coming New Year you will get rid of your lung trouble and return next summer in good health. I suppose you will have had a lonely X-mas, and it was very kind of you to write such an interesting letter on that day. I spent the day also very quietly; we had a tree for the children but I soon retired to my rooms and continued to work on the *Coleoptera* which you collected last summer at the Huron Mts., Lake Superior. I am determining these beetles very carefully and make a list of the species. I have finished the *Carabidae* and *Staphylinidae*, the two best represented families and find among them a *Platynus*, new to our collection (no name for it yet) and a beautiful undescribed *Omalium* also new to our collection and the L.S. list. The entire collection will amount to about 150 species.

I have also finished the mounting and labeling of your Arizona lot No. 1. The box labeled "Hemiptera from Larrea and Mesquite" contained two species of *Capsidae*, one *Tingis*, two

Cercopidae, two Jassidae and a very young larva of a predaceous Heteropteron allied to the Wheel bug. Among the Psyllidae from Mesquite in the capsule I find three species of *Rhinocola*, all undescribed, one being identical with that you found on Larrea and the second very remarkable on account of the long spines on head, thorax and wings. As I wrote you before, there is considerable doubt in my mind whether the Mesquite is the real food-plant.

I have prepared a complete list of your Arizona lot 1 which will be quite useful for reference upon your return.

I hope that by this time you will have received the box of supplies sent by express, and my two letters referring to your lot No. 1 and the envelope with packing paper. Another of your tin boxes is returned herewith, and I also send you a box of cigars which I beg you to accept as a X-mas gift. Let me know when you want more. Even if you do not smoke all of them yourself they come quite handy occasionally to make friends.

I have procured some large fruit jars and am now ready to breed insects from any twigs or roots etc. you may send on. In fact I would like very much to have you send on such things. I am well aware that this will cause you considerable trouble and expense but a good many insects can be obtained thereby which cannot be found otherwise, and as to the expense I will share it with you.

You seem to have trouble in getting your mail but you must remember that in a small place letters and packages are not delivered. During my stay in San Diego, Tex. I had to walk every day down to the post office, a distance of nearly half a mile.

Now to your letter of the 24th! I read it several times with intense interest, then went to the office and read it to Dr. Merriam who got quite excited at your account of the rat nest and had your letter at once copied. He informs me that all the rats of the Southwest which construct large piles of debris over the nests belong to the genus *Neotoma*; that there are quite a number of species within the U. S.; that the species found in the plains at Tucson is *N. albigula* and that in the mountains near by there is another species. Further, that he never found the rats in their nests but that the structure of the latter as described by you has

never been properly described and that any further observations on this subject would be most welcome to him.

(I shall continue this letter this evening)

Yours ever,

E. A. SCHWARZ

Washington, D. C. Dec. 29/96

(Continuation)

Dear Hubbard,

When you were here I think I told you that while on the stage near Brownsville, Tex., I saw plenty of those large rat nests but since they did not occur near San Diego I was unable to investigate the nest. However while looking at these remarkable structures in the midst of the *Opuntia* thickets I realized two points, first, that the nests must contain some peculiar insect parasites and inquilines, and secondly, that the investigation of the nests without proper implements must be a matter of great difficulty on account of the cactus spines. The large blood-sucking Hemipter you found in the nests is probably only the common *Conorhinus sanguisuga* Lec. which is quite abundant in Arizona, though it is not impossible that it may be another species of the same genus. The occurrence of this bug in rats' nests is not yet recorded but Coquillett told me this morning that he found *C. sanguisuga* in the nests of the same or allied species of rat near Los Angeles. The other species you mention in connection with this rat will be no doubt of considerable interest including the flea. The Coleoptera I fail to recognize except the "elegant yellow *Lebia* with steel blue elytra" which must be *Lebia chloroptera* Chaudoir, although I never saw this species before; nor is it in our collection. Dr Merriam tells me that most specimens of the *Neotoma albigula* which he or his men had trapped proved to be badly infested with a bot-fly larva (Oestridae). This must be a new species but it will be quite difficult to get hold of the imago unless you find the puparium in the ground beneath the nest.

The occurrence of *Gopherus agassizii* near Tucson is very probable since it is recorded from Ft. Yuma. Merriam in his Death Valley Report says: "This tortoise is remarkable . . . for

its power of living in the arid deserts of the Lower Sonoran zone, far away from water."

Regarding insects on *Cereus giganteus* I never heard of any living in or on the healthy plant but Dr. LeConte records plenty of species in or beneath "decaying" plants and most probably you will also find them if you come across a decayed *Cereus*. The larva of a *Monilema* is, however, sure to be found in the roots of the living plant. The "cavity" in *Cereus* which you mention has probably been made by a woodpecker who stored the *Parkinsonia* seeds in it. *Bruchus amicus* is recorded from seeds of *Parkinsonia* from Arizona and is a rather large species, very gray but with indistinct reddish disk of elytra.

The fragments of Tenebrionids, Lachnosternas, Hoplias (?), etc., indicate a fauna which probably will not make their appearance before next April.

The small bristly Curculionid from *Phoradendron californica* is apparently the same *Tychius* which you sent (one specimen) among your lot 1 and to which I referred in one of my letters. I doubt that this species has any thing to do with the *Phoradendron* and suppose that it will live in the twigs of the "claw Acacia" (what species is this?) or in those of Mesquite. I most seriously doubt that your "most minute shining black Coccinellid" from the same plant is really a Coccinellid; it will be a Nitidulid of the genus *Cybocephalus* which have the power of rolling themselves into a ball like *Agathidium*. In southwestern Texas I found such a little *Cybocephalus* on *Phoradendron* feeding on a scale insect and the same species occurred on *Opuntia leptocaulis*. Mr. Knoebele found in California a very peculiar genus of Psyllidae on *Phoradendron*, and this is the only insect recorded from this plant.

The "black *Bruchus* with red spots on elytra" in acacia seeds remains for the present undetermined; do not fail to give me the scientific name of the Acacia. I forgot to mention above that *Bruchus ulkei* has been bred in Arizona from seeds of *Parkinsonia*. This is a tolerably large species, gray with a large black dot on elytra; it is the rarest in our fauna and wanting in our collection.

Regarding the rats' nest insects I would like to draw your attention to the "swarms of small Lepidoptera" because these may

prove to be a great interest and I hope that you did collect some good specimens. The Japyx, also, must be something good and probably a new species.

The large *Hydroporus* black with white mottlings is apparently one of the *Laccophilus* peculiar to Arizona. One of these species collected by Morrison is in our collection but the other is wanting.

Now this is about all that I can say of your insects without seeing the specimens and I can only assure you that I look forward to the receipt of your boxes with no small expectation.

I repeat what I have said in one of my earlier letters: do not overexert yourself in the pursuit of entomological explorations but always consider that you have undertaken this trip for the sake of your health. Do not dig into any of the so-called gopher holes without hiring a Mexican or someone else and do not continue the raking up of the rats' nests if the work is too laborious.

All the boys in the Office, including Dr. Merriam and Prof. Fernow, send their best regards and wishes to you; the same with Mr. Havenstein and Mrs. Kuhlmann.

News in entomology are very scarce; in our Office Mr. Nathan Banks has again been appointed as an assistant after a civil service examination. He is to do bibliographical work to continue Henshaw's bibliography of Economic Entomology.

I enclose some letters to Arizona parties written by Fernow for the purpose of introducing you. You will not need them, however, until the coming spring. If you are desirous of seeing the Papago Indians, Fernow says, you should by all means run out to the reservation and call upon Mr. Berger, the Sub-agent of the reservation and who is said to be a good fellow.

Yours ever,

E. A. SCHWARZ

Washington, D. C. Dec. 31/96

Dear Hubbard,

Nothing could give me more pleasure and furnish more excitement than the perusal of your letter of the 26th; 1st, because of the very gratifying account of the state of your health, and I feel confident that the improvement will be a permanent one; 2nd, on account of the exciting account of your exploration of that good

old *Cereus* trunk. I am afraid the name of the benefactor who cut the hole with his axe will forever remain unknown. In my last letter I wrote you about the fauna of "decayed trunks of *Cereus*" so frequently mentioned by LeConte but I could not know that you would strike so soon a favorable trunk in the right condition. Of course I shall report on your rats' nest and *Cereus* fauna as fully as I can as soon as I receive them but whatever they may turn out to be, it is evident that your letters deserve to be published as soon as the necessary determination of the insects can be made. I shall write you about the subject of publication later on.

Some of the *Cereus* insects I recognize with more or less certainty because their habits have been mentioned by either LeConte or Horn or Casey who have visited Arizona; but there are many others which I fail to recognize because no such thorough investigations as yours have ever been made.

"Philontid with large head, black with red elytra, etc."—This is pretty certainly *Belonuchus Xanthomelas* Solsky, of which Dr. Horn gave me a few poorly preserved specimens.

"Monstrous Aleocharid, etc."—This is unquestionably *Maseochara semivelutina* Solsky, new to our collection. Three other closely allied though smaller species are reported from the Southwest and northern Mexico of which you will find no doubt *M. (Aleochara) valida* Lec. which is entirely black. The latter species may be among your "smaller unicolored Aleocharinae."

The "Stilicopsis or allied genus" remains unidentified. Ditto. the large "fly larva."

The "immense Hololepta" is pretty safely *Hololepta yucateca* Marseul (*princeps* Lec.) the males of which are sometimes of prodigious size. Casey has made several attempts to break up this species into several ones. In our collection there are ♀ ♀ and a feebly developed ♂.

"Large Scyphophorus or Sphenophorus larvae."—These are safely those of *Cactophagus validus* Lec. of which we have in our collection 3 specimens from Morrison's collecting.

"Phalacridae both large and small and Histeridae of two species."—I cannot tell anything about them at present except that *Paromalus* (Histeridae) *opuntiae* Lec. is probably one of your species. We have some specimens from Morrison's collecting.

"Black Tachyporus as large as an average Tachinus" is unquestionably *Physetoporus grossulus* Lec. described by LeConte from "Arizona; in trunk of *Cereus giganteus*." Your "other species like a small Conosoma" may be *Erechomus punctipennis* Lec.

The various Curculionidae mentioned by you remain utterly unknown to me but it is safe to say that they will be among the most interesting *Cereus* insects.

"Ditoma which looks like ours."—This is pretty safely *Ditoma ornata* Lec. of which we have several specimens from the Morrison collection.

"Small Uloma and flat Tenebrionid near Cynaesus."—Remain unknown to me, and the same is your Bruchus, the "minute Staphylinid, perhaps an Euplectus," "several Bryaxis like Pselaphids." Of Pselaphids from Arizona we have in our collection only a single species, *Otenistes pulvercus* Lec.

"Small Hololepta."—This must be *H. cacti* Lec. which is not in our collection.

I agree with you that it is strange that you fail to find any Nitidulids in the *Cereus* but these may hibernate elsewhere in the imago state.

It has been terribly cold here for the past 8 or 10 days; there is skating on the Potomac. You never tell anything how the climate of Tucson strikes you.

Yours ever,

E. A. SCHWARZ

Washington, D. C. Dec. 31/96

Dear Hubbard,

After further study of your *Cereus* letter it occurs to me that your "Phalaeridae both large and small" will probably turn out to be Hydrophilidae allied to *Cyclonotum* (the larger) and *Cercyon* (the smaller ones). Some of these genera live in decomposing plant matter, and *Cyclonotum cacti*, a comparatively large species has been described by LeConte from "putrid Opuntias." The species is now referred to *Dactylosternum* of which you found on Montserrat another species, *D. abdominale*, under "ciba bark."

You also mention Scydmaemidae, and I would only say that we have only a single species of this family from Arizona in our collection, *viz.*, *Eumicrus tarsalis* Casey, which is a rather large-sized species and has been collected by Morrison.

It is a pity that the Coleoptera collected by Dr. LeConte have been described in all sorts of publications running through many years. It is only in the oldest of this series of papers (published in Ann. Lyceum Nat. Hist. N. Y. 1851-2) entitled: "Descriptions of new species of Coleoptera, from California" that he refers to his expedition which was undertaken "during the year 1850 and part of 1851." At that time there was no such thing as Arizona but everything was California. He says: "My collection was made in the following manner: At San Francisco (here follows various localities in California), etc. . . . at Vallecitas (in southern California) and the desert of the Colorado, in October and November; Colorado River, December and March; Valley of the Gila, in January and February." At that time there was no Ft. Yuma and probably also no city of Tucson but LeConte must have crossed the Colorado River some distance south of Yuma at the old stage route; what precise locality he means with "valley of the Gila" I do not know but he means no doubt the lower part of the valley from Ghila Bend westward. Numerous new species of Tenebrionidae, Dytiscidae, Carabidae, Authicidae, Histeridae and Meloidae are described by LeConte in that paper which shows that the winter fauna of that region must be quite rich in species, and it appears to me that Tucson is, entomologically, not favorably situated. You will no doubt later on visit the lower Ghila and the Colorado River where you will experience less trouble than now in hunting up the fauna.

Yours ever,

E. A. SCHWARZ

Washington, D. C., Jan. 3, 1897

Dear Hubbard,

There was great excitement with me when upon my return from office I found yesterday your letter of Dec. 28th containing again a lot of interesting news; but the package was not there! Mrs. Kuhlmann, however, informed me that the letter carrier had

the registered package; so I rushed at once to the post office and fortunately got it. This enabled me to get at the contents at once but after working like a whole family of beavers yesterday night and this whole Sunday I have become painfully aware of the fact that you have completely swamped and overpowered me with "embarras de richesses" as Prof. Riley used to say. My, it will take me a whole week to mount this immense material and a whole month to get it named! In fact I did not know where to commence, but I opened at least every box and spread out the contents to see whether everything was in good shape. Good that I did so for in the box containing *Opuntia* species that *Acalles turbidus* had come to life again but fortunately without doing much damage. Look out for those hard Curculionidae and kill them with dry heat.

I have at last mounted the Rats' nest material and even did a little determining. The species are as follows:

1. "Large blood-sucking Hemipter."

I should think this does not differ from *Conorhinus sanguisuga* Lec.

2. "Very small blood-sucking Hemipter."

Very remarkable thing, evidently allied to the common Bed bug, but I cannot name it. Do not remember having seen it before. Shall try and have it named.

3. The rat-flea.

Have not found it so far among your material.

4. "Lebiid, yellow, with steel blue clytra."

This is *Lebia majuscula* Chaudoir (not *L. chloroptera* as surmised by me), a species known from Arizona and Sonora. We had only two specimens in the collection. It is closely allied to our common *L. grandis* and I wonder whether your very slender larva really belongs to it.

5. "Lebia resembling a *Calathus*, castaneous and unicolorous."

This is *Plochionus pallens* Fabr., widely distributed in the tropics but new to our collection.

6. The *Silvanus* from rats' dung is *S. opaculus* Lec. described by LeConte from "the Colorado River under bark" (probably from Ft. Yuma), a very rare species and new to our collection.

7. The Cryptophagus from rats' dung is apparently undescribed and, while not a remarkable species, it is easily recognizable by its dense punctuation. Also new to our collection.
8. "Reddish oval Tenebrionid, size of *Dioedus punctatus* but in form like a *Platydema*."
This is really a *Platydema* which I never saw before. Nor can I find that it has been described. New to our collection.
9. "Other Tenebrionids."
One specimen of *Triorophus laevis* Lec. (black, legs reddish, head with a large tubercle).
10. "Other Tenebrionids."
One specimen of *Eurymetopon emarginatum* Casey (slightly smaller than the preceding and of regular oblong-oval outline). This and no. 9 we have from Morrison's collecting.
11. "Other Tenebrionids."
One specimen of a remarkable ? *Blapstinus* which I never saw before and which is new to us.
12. "Anthribide."
This is a new *Brachytarsus* which I never saw before; allied to *B. variegatus*. New to our collection.
13. "Scaphidiid."
This is a *Scaphisoma*, not at all remarkable but which upon close comparison may prove to be different from our eastern species.
14. "Small Histerid."
Does not appear to differ from *Paromalus opuntiae* which is so common among your *Cereus* insects.
15. "Large Asida with bright blue pruina."
Is *Centrioptera verrucosa* Lec., but the pruina is gone. We have this from Morrison's collecting.

The Myriapods and the Japyx (which should be something good) and finally the Lepidopteron have apparently not been sent by you. I sincerely hope that you preserved some of the Lepidopter since it is unquestionably something of great interest.

The above are all the rat insects mentioned or sent by you. It strikes (me) that, except Nos. 1, 2, 3, possibly 7 and the Lepi-

dopter, none have a direct connection with the rat. Should it not be possible to find something like *Leptinus* in the nests?

Your success with the *Cereus* insects is really astonishing and the enormous number of specimens you send prevents me at present from giving a list of the species. As far as I can see all insects ever reported from *Cereus giganteus* are represented in your collection and various new ones besides. I only miss one, viz., *Xanthopygus cacti* Horn, discovered by Dr. Horn at Camp Grant, Ariz., on "decomposing *Cereus*." It is a genus near *Staphylinus* and the species is black with bluish-black elytra and yellow tail; size of an average *Staphylinus*.

How many of your species are peculiar to this plant I cannot tell at present but when I have worked up your material I shall write you more on this subject.

[Here follows a preliminary list of the species found by Hubbard. See *Psyche*, Vol. 8, 1899, Supplement, for Hubbard's "*Insect Fauna of the Giant Cactus of Arizona*."]

This letter is by no means finished but for the present I will close up and go to bed.

E. A. SCHWARZ

Washington, D. C. Jan. 4, 1897

Dear Hubbard,

I have shown your letter of Dec. 28 to Dr. Merriam who read with great interest your account of the fauna of *Cereus giganteus*. He says you are no doubt right in your conclusions but the holes in the trunks are not made by the owl but by the woodpeckers for storing seeds. The owl only uses the hole for sleeping quarters. There is a ridiculous superstition that the woodpeckers make the holes for the purpose of obtaining water during the dry season. Dr. Merriam says that these holes are extremely frequent throughout the entire *Cereus* region, and this explains perhaps why LeConte, Horn and Casey never experienced any difficulty in finding "decomposing *Cereus*." By the way, Dr. Horn's headquarters in Arizona was Camp Grant, on the San Pedro River, and this must be a most favorable locality.

There were among your lot II two envelopes—one containing mesquite pods from the rat's nest, the other galls on cat-claw acacia and seeds of *Echinocactus*—but they are not referred to in your letter. I put the mesquite pods in a jar to breed whatever may be in the beans, and the same with the acacia galls though most of them look very old. What shall I do with the cactus seeds? Parasites still continue to come out from the Mantis egg mass, and when mounted I shall turn them over to Mr. Ashmead.

Toumey's *Chilocorus* is *Ch. cacti*, the larva of which has been observed by Comstock to feed on scale insects on Oleander in southern Cala., and it is not surprising, therefore, that it should feed on the *Parlatoria victrix* on date palms at Phoenix. The imagoes have frequently been found feeding on various scales but it cannot be denied that the species prefers to feed on Cactus scales. The tree cricket injurious to tobacco will be determined as soon as it can be mounted.

Four microscopic slide boxes are to-day mailed to you under Department frank, and I also return that you sent to me.

As to the Hemiptera I confess that I prefer to mount them myself and I shall turn over to Heidemann a good set but I could propose that you keep the first set for subsequent transmission to the Nat. Museum.

I inclose the revised list of the Coleoptera of your lot 1. You will see that I succeeded in generically locating that new Scolytid, and that I also named that large Otiorhynchid, *Eupagoderes decipiens*, to which you refer in your last letter. Well preserved specimens of these desert weevils (you will no doubt find various species) are most welcome, for those in the collections are mostly old alcoholic specimens which have lost all their beauty. The *Hyperaspis* you sent I concluded to consider as an extreme variety of *H. fimbriolata* which is not yet described.

It will take considerable time before I can furnish a similar list of your lot No. 2 and meanwhile you must be satisfied with the preliminary determinations of my last letter.

Two letters evidently inclosing checks from Railroad Co.'s have recently arrived and were forwarded by me to Mrs. Hubbard at Detroit.

Yours ever,

E. A. SCHWARZ

Washington, D. C., Jan. 5/97

Dear Hubbard,

I have just received a letter from Mr. Wenzel, of Philadelphia, with the news that Horn was stricken with paralysis at the Columbia Club during a game of cards (exact date not given). His left side is paralysed but his physician has hopes of bringing him around. For some time I was afraid that something of this kind would happen to Dr. Horn and I can only hope that he may recover.

Yesterday evening, instead of going to the Cosmos Club I remained at home and mounted two layers of your *Cereus* insects. Then I carefully looked at the mounted specimens and the results are the following changes and additions to my preliminary list:

Change *Belonuchus xanthomelas* to *B. ephippiatus* Say. New to our collection. Say described it from Mexico and LeConte (in the edition of Say's writings) adds: "I found it at San Diego, Cala., under dead *Opuntia* leaves.

After *Paromalus opuntiae* omit P. sp. and insert:

Paromalus consors Lec. Originally described by LeConte from specimens "found at San Diego, Cala., in decaying opuntias" in company with *P. opuntiae*.

Paromalus gilensis Lec. Originally found by LeConte "ad flumen Gila in *Cereis giganteis putridis*." This adds another species to the astonishing large number of species new to our collection.

The three species of *Paromalus* found by you in *Cereus* are readily distinguished by the difference in the elytral striation.

You will notice that there are quite a number of *Cereus* insects of which, in addition to several new ones, you seem to have found all except two, viz., *Xanthopygus cacti* and *Erchomus inflatus* Horn. The latter greatly resembles the *Physetoporus grossulus* and may be still among your unmounted material. The *Cereus* fauna may be divided into three groups: (1) Species peculiar to *Cereus giganteus*; (2) Species peculiar to cactus plants in general; (3) Species of more general habit, for instance, such as occur also under moist bark of trees. There is very little known on this subject but I think you will have opportunity to ascertain to which division your species belong.

The parasite on Mantis eggs has been determined by Ashmead as *Podagrion mantis* Ash., which infests Mantis eggs throughout North America. The other parasite on a hymenopterous cocoon on *Prosopis* is an undescribed *Eupelmus*.

I was greatly mistaken when I wrote you that I could mount your lot 2 within one week; it will take me more than two weeks.

I sincerely hope that you are doing well. Write me how you find the climate, and whether you are satisfied with your quarters and with the meals. Do you get much information from Toumey? Did you make the acquaintance of Dr. Rogers?

Yours ever,

E. A. SCHWARZ

Washington, D. C., Jan. 10, '97

Dear Hubbard,

I wrote you before that you have utterly overwhelmed me with the multitude of specimens of your lot 2 but with the arrival of your lot 3 this misfortune has increased to a calamity. I do not know how and when I shall catch up in mounting or determining. During the past week I had not a minute to spare for your specimens: I had to straighten up my books as treasurer of the Entom. Soc. of Wash.; on Thursday there was a meeting of the Society in my house and, worst of all, since Wednesday Mr. J. B. Smith, Mr. Hopkins and Mr. Alwood have made their appearance, each with a big box of specimens for determination. They made my rooms as their headquarters and left yesterday night.

To-day (Sunday) I have been busy the whole day with mounting your *Cereus* specimens of lot 2 but made little impression upon the immense number of specimens still to be mounted. I had not even time to do a little determining and, for the present, you must be satisfied, to my regret, with an acknowledgment of the receipt of your lot 3 (registered package; box with *Monilema*, two packages of *Cereus* pulp) and with a short account of "Cioid" from Giant Cactus. Your letter of Jan. 3 arrived here on Friday (Jan. 8) and I read it repeatedly with intense interest and greatly wondered that the *Cereus* fauna did not seem to have any end. I must confess that your account of the "most marvelous Cioid" did not strike me particularly and made up my mind

that it was a species of *Ozognathus* (Ptinidae), the males of which have peculiarly-formed horns on the head. On Saturday upon returning from Office after 4 O'cl. P. M. I found your package and in order to see whether everything was all right I opened the pill boxes. When I came to the box containing the "Cioid" and looked at the latter I came near being paralyzed and it required a superhuman effort and a swallow of whiskey to recover. Your Cioid turns out to be a most remarkable and entirely new genus of Scolytids!! In fact it is a long time since I put my eyes upon a more odd-looking creature than this species. After recovery I mounted at once a couple of specimens, for it happened that at 5.35 P. M. I had invited Smith, Hopkins and Alwood to dinner at Gerstenberg's with the understanding that they should spend the evening hours in my room, all three of them to leave between 9 and 10 o'cl. with the B. & O. R. R. During dinner (everything as usual fried in cockroach grease) I narrated about that Scolytid and Hopkins could hardly wait for the time to look at it. Upon returning home the specimens were at once exhibited and Hopkins became perfectly wild with excitement and cursed his miserable West Virginia Scolytids because they did not show any distinguishing characters except after a most painful scrutiny. One of your Scolytids ♂ happened to be alive and we had an opportunity to watch the movements of this wonderful species. Smith got also excited and in order to prevent further mischief I had Ida at once fetch a pitcher of lager beer. This smoothened the excitement and two subsequent pitchers were drunk to your health, and it was unanimously voted that no one but yourself would have been able to unravel the secrets of the *Cereus* fauna.

The affinities of the Scolytid are at present entirely obscure to me and I do not know whether it belongs to the Tomicinae or Hylesininae. Of course I had to give Hopkins a few specimens and he promised to make dissections of the mouth-parts and genitalia.

During this week I hope to have more time and shall try my best to mount and determine your lots 2 and 3.

Yours ever,

E. A. SCHWARZ

P. S. Not only one of Scolytids but also several of the *Cereus* Calandrids were alive in your boxes. Your Cyanid does not seem to work well or you take the specimens too soon out of the collecting vial. No serious damage has been done but I beg you to be careful in this respect.

E. A. S.

Washington, D. C., Jan. 11/97

Dear Hubbard,

As I wrote you yesterday, it will take considerable time before I can get at your lot 3. In fact I have only looked at a small proportion of the specimens and for this reason I can reply to your letter of Jan. 3 only in a fragmentary manner. The following remarks refer mostly to *Cereus* insects mentioned by you:

The "large Calandrid, not shining, elytra black, without sculpture" is unquestionably *Cactophagus validus* Lec. The allied genus, *Metamasius sericeus* Latr. (smaller than *Cactophagus*, opaque, black variegated with red) is also reported from Arizona but nothing is recorded of its habits. From its general appearance it belongs either to the *Cactus* fauna or the *Yucca* fauna. We have a good series of *C. validus* in our collection (Morrison) and you will no doubt find it plentifully later in the season.

Among the small delicate *Cereus* things I glanced only at the "small shining, almost spherical things, perhaps a *Liodes*" and had the impression that it is a new species of *Ephistemus* (Cryptophagidae) which I have not seen before.

Extremely glad to see the brilliant Staphylinid, *Xanthopygus cacti* among lot 3. It is a genus new to our collection. You write that you sent it also with lot 2 but strangely enough I have not yet come across the specimens.

Of the marvellous Scolytid I wrote you yesterday and will merely add that this morning I looked at a few specimens and came to the conclusion that two species are represented among them, one in which the horns of the ♂ are long, straight, porrect or vertical; the other in which the horns are shorter and recurved over the thorax. There are also differences in the elytral sculpture.

The "small Anthonomus-like Curculionid with rough sculpture" I have unfortunately not yet seen, but is no doubt something of unusual interest.

There are so many Cleridae reported from Arizona that it is impossible to tell to what genus your "small hairy larva" belongs.

The large silvery-grey Bruchus is *B. amicus* reported before from Parkinsonia seeds. One of your large pale-brown Bruchus with black spots is the common Mesquite species, *B. prosopis*, but there are evidently other species among your material which I cannot name offhand. The Palo verde in southwestern Texas was not infested by insects (except the *Bruchus amicus*) but I think the shrub is not native there and has only run wild from gardens. In early summer the flowers attracted Malachiids and Diabroticas. As I wrote you before, a great many of the Cereus insects are reported also from other Cacti and Coquillett found many of them near Los Angeles in *Opuntia engelmanni*. The *Hyporhagus* from *O. engelmanni* is not yet determined; the Acalles from the same plant is *A. tubidus* which I found commonly at San Diego, Tex. On *O. leptocaulis* you will no doubt find later in the season another, smaller Acalles and also the larva and imago of a blue- and red Disonychia (*D. varicornis*), and also a black, opaque Baris, all of which I found in southwestern Texas.

Coquillett has published a note in Insect Life stating that *Maseochara valida* (one of the giant Aleocharinae in Cereus and Cactus) is truly parasitic in the puparium of the Cactus flies. I never can believe this and maintain that the Maseochara larva is merely predaceous and enters the fly-puparium to devour the contents. Perhaps you will be able later in the season to throw some light on this point.

Your most interesting letter of the 4th came this morning. I am quite astonished to learn that the weather is so cold with you; I always thought that there was never any frost at Tucson. It seems from your account that the winter fauna of Tucson is after all not so poor as you complained of at the beginning and that besides the bonanzas in the rat's nest and *Cereus giganteus* you bring together a respectable collection. Of the larger Tene- shall report on it in my letter to be mailed to you at San Diego.

brionidae, any Arizona specimens, even the most common species, are very acceptable to our collection, and later on when you visit localities you must not forget to take specimens at each locality. The great confusion that exists in Coniontis, Eusattus, Asida, Eleodes, etc., as to what should be considered as a species results mainly from the carelessness with which specimens have hitherto been collected and labeled.

As a matter of course we will name and return Mr. Brown's insects or anything he or you may send on of his collection. The large *Strategus* is no doubt *S. julianus* (a ♂ is desired for our collection); the smaller must be *S. cessus* (an extremely rare species not in our collection) or a new one. If Mr. Brown's Solpugo (large Arachnid looking like the Idaho devil, *Stenopelmatus*) is a large one, it is *S. (Datames) formidabilis* Simon; if it is a small one it can not be named without seeing the specimen. If the large "Alindria" is of blue color it is *Trogosita (Temnochila) virescens* which occurs everywhere. The Clytid from Mesquite wood piles is *Cyllene crinicornis*, extremely abundant in southwestern Texas. Under the same conditions you will find later in the season various Chrysobothris and other Buprestidae—The small, not hairy Cotalpa is probably *C. flavida* Horn. The small Lachnosterna is probably *Listrochelus*. The "Coccinella 15 punctata" may be our common *C. oculata*.

I do not believe that any adobe wall will contain Anthrophora colonies, and I mentioned this subject to you only in order that you may be on the lookout for them. Should you find a Meloid in them it will probably differ from *Hornia minutipennis*.

Your account of the Sta. Cruz River canons reminds me of the San Diego River at San Diego, Tex., but the latter has vertical cliffs of solid lime stone and there was not a drop of water in it during the whole of my stay; the small side canons had also rock walls but swarmed with Eleodes which had fallen in from above.

Even if the burrows of *Gopherus agassizii* should furnish no insect fauna, its dung will no doubt be frequented by the various species of Aphodius, etc., peculiar to Arizona.

I am afraid you will be disappointed with your winter visit to the great Mesquite forest. In April or thereabout when the trees

will be in bloom they will no doubt swarm with a multitude of Cerambycidae, Cleridae, Chrysomelidae, Meloidae, etc., but I do not know whether there will be any insect life in winter. If the forest is composed of real trees (not mere shrubs as is the case with the Mesquite "forest" of southwestern Texas which is at least 4 times larger than that of Arizona) you may find various good things. At any rate I am greatly curious to learn of your experience.

The specimens you sent to the Department have safely arrived. Pergande showed me Comstock's types of *Tachardia Carreae* and this is *evidently* quite different from your species though both, with a third species, occur near Tucson. The tin boxes you sent are herewith returned to you and I also will at once return the wooden box. From the Division of Mammalogy I learn that a species of Wood rats (*Neotoma*) occurs here at Washington among the rocks along the Potomac near Great Falls but this species never builds a pile.

The whole of last Saturday and to-day (Monday) I was occupied in the office with straightening out the galley proof of your full article on Ambrosia beetles but it proved to be a big job since the Editing Division has made a complete mess of the text and a still more complete confusion with the figures. There was some tall swearing on my part but the work is nearly done. By some queer coincidence I have just now come across a figure of the ambrosia of *Xyleborus dispar* published by R. Goethe in 1895 in a German publication extremely difficult to find and the title of which would fill 3 lines. His text is only a short note, with the figure, is only one page long. He does not give any description or determination of the ambrosia but merely states that he saw it being eaten by beetles. The character of his drawing is, however, exactly the same as that of your drawings. If I had discovered this figure sooner we would have made a copy of it for insertion in your paper, but so it was too late and I added only a short reference to Goethe's publication.

I most sincerely hope that this letter will reach you in good health.

Yours ever,

E. A. SCHWARZ

Washington, D. C., Jan. 18/97

Dear Hubbard,

I have received your card of the 10th and your letter of the 11th, and this (Monday) morning four packages arrived, two containing *Neotoma* nests, the third that *Polyporus* fungus and the fourth that most surprising find of yours in the woodpeckers hole in *Cereus*. Your card informs me of your intended trip to San Diego undertaken I suppose to have your round trip ticket stamped, but you do not say whether and when you will return to Tucson.

Since you write that you are not certain whether you will stop at Yuma I write only a few lines but let you know that I shall write fully in answer to your letter of the 10th and that you will find my letter at San Diego on January 25th.

If you stay over at Yuma I am afraid you will be disappointed with the insect fauna there at this season but a large number of species are reported from that region. In 1850-51 Dr. LeConte was in that region, and in looking over his descriptions I find that almost all of his species were either found at the banks of the river or "under bark of Cottonwood trees." Many of these species are not in our collection, e.g., the various Anthicids and a small flattened Staphylinid, *Eleusis fasciata* (Omaliid group) from Cottonwood bark; but I am afraid all these fine things will not be about during this unusually cold spell you have in Arizona. In California you will see so many new features that I suppose you will have no time for entomological researches. The beach fauna of San Diego is very rich in species and has been well explored but at this season the insects will probably be absent. A little railroad goes from San Diego to National City and thence across the Mexican frontier a short distance into Lower California and then you have a chance of visiting the latter country.

Since I wrote you my last letter I have been hard at work every evening and the whole of yesterday (Sunday) mounting your lot 2 and I have fortunately finished the lot excepting one layer of small *Cereus* Aleocharinae. I have also mounted the contents of the second tin box (the first contained things given you by Brown or Toumey) which I have marked "lot 3 A" and shall report on it in my letter to be mailed to you at San Diego.

The Polyporus came to hand and I see the Lepidopterous larvae, which will not be difficult to breed, but unfortunately not the little spotted Melandryid. I cannot even guess what this species may be but I presume it will be something new. At least a portion of the Tenebrionid larva from *Neotoma* nests are apparently in good condition and I hope to breed the species. The larvae is certainly not an *Eleodes* and may belong to *Nyctobates*.

I sincerely hope that you have recovered from the accident to your eye; the beating of the mesquite branches into the carriage is a danger with which I became thoroughly acquainted during my stay in southwestern Texas. I also hope that these lines may find you in good health in spite of the cold weather and that you may enjoy your California expedition.

Yours ever,

E. A. SCHWARZ

Washington, D. C., Jan. 20, 1897

Dear Hubbard,

I wrote you yesterday a short letter to Yuma but it contained very little information and it would, therefore, be no misfortune if it should not reach you.

This morning I received your letter of the 15th and 3 packages (2 with Toumey's pinned specimens, and one with miscellaneous material not yet investigated by me).

I hope your health will not suffer under the influence of this miserable cold weather you have at Tucson. I am watching the daily weather maps and feel extremely sorry for you when day after day a rain area is marked over southern Arizona. Better times are sure to come, however, and perhaps the spring collecting will be better on account of the unusual amount of winter rain.

From your letter of the 11th I am greatly pleased to hear that my reports on your insects are satisfactory to you but I can only assure you that I derive a still greater pleasure from the perusal and study of your letters so full of life. Your short but characteristic descriptions of insects together with that card catalogue which I have constantly on hand enable me to recognize in many

instances your species but of course there are numerous mistakes which can be corrected only upon a study of the insect itself. Among the Washington entomologists there is unfortunately not one who is able to appreciate your letters but friend J. B. Smith who read them got quite excited with interest. Upon your return we must by all means arrange a publication of these letters.

Your account of the Sta. Rita Mts. expedition opens a new vista upon the hitherto unexplored insect fauna peculiar to the Yuccas, Agaves, Dasyliirions (I never saw this plant) and the other plants you mention. Of Yucca insects a number of them are on record, besides the Yucca Lepidoptera; as to Coleoptera, neither LeConte or Dr. Horn seem to have investigated this fauna, and Crotch was the first to find some of the species peculiar to the plant, including the genus *Yuccaborus* and the remarkable *Trogosita yuccae* (not in our collection). But this was in the Mohave Desert of Cala.

Of Dasyliirion insects very little is on record; in fact I know only a short note by Townsend (Insect Life 5, p. 38). He mentions only two Coleoptera, the beautiful Buprestid *Thrincopyge alacris*—"almost every last year's Dasyliirion stalk is bored and tunnelled throughout its length by this Buprestid." (This is in Solidad canon, Organ Mts., of New Mex., and the plant is *D. wheeleri*.) The second species is "*Rhizophagus* sp." (certainly no *Rh.* but I cannot make out what it can be) of which he says: "the beetles were distinctly seen to be eating into the young paniculate flower buds which were at this date (May 23) just developing beneath large protecting scales on the main stalk. Under these scales the beetles were numerous, and not only the embryo flowers, but the stems which hold them, had been extensively eaten." The large Calandrid mentioned by you is no doubt a *Scyphophorus* (probably *acupunctatus*) though I am not aware that any species of this genus is reported from Dasyliirion.

Of Agave insects there is also very little known; Crotch described the Nitidulid *Anthonaeus agavensis* from flowers of Agave at San Diego, Cala.; and Riley mentions (Proc. Ent. Soc. Wash. II) a few insects bred from old Agave flower-stems, two being Coleopterous, the Buprestid genus *Thrincopyge* and a small new Calandrid. Finally, Wickham records *Zygops niveus* (me-

dium sized, black & white Curculionid allied to *Copturus*) common on the leaves of the Mescal plants in the Pinal Mts. north of Tucson and states that various Lebiid beetles are to be seen on this plant but that is quite difficult to get at this fauna.

The *Fourcroyeria* is a plant unknown to me and never mentioned in entomology; the same is with the *Microramnus*. Whether your *Celtis* will be as rich in insects as the Texan *C. texana* I do not know. The shrubby *Celtis pallida* in southwestern Texas did not harbor Coleoptera but a remarkable Psyllid, which rolls up the leaves. I am not aware that any entomolog. traveler in Arizona has ever referred to insects living on *Celtis* in that territory but Morrison sent from Ft. Grant a species of *Pachypsylla* which necessarily lives on *Celtis*.

Your Tenebrionid larvae from *Neotoma* nests I have given into the care of Pergande who will do his best to breed them but he says he had hitherto no luck whatever in breeding here Tenebrionid larva coming from the arid West.

Pergande also informs me that your "?? Sinoxylon larvae" given you by Mr. Brown from the Termites-eaten house post, are the larvae of an ant which had no doubt its nest in the old excavation made by the *Calotermes*.

In both of your last letters (Jan. 11th and 15th) you report on additional discoveries of the desert fauna in the vicinity of Tucson and I think I will find the specimens in the box which came this morning. This fauna as investigated by you is getting quite numerous in species and the same is to be said of your collections on Mesquite bushes. In your lots 2 and 3 there are various contributions to this Mesquite fauna, each containing the little Apion, *Tychius setosus* and the queer little Psyllids but each also containing one or more interesting little things not sent by you before, most of them being uniques. I shall report on this fauna in full at a later opportunity.

I have finished the mounting of your entire lot no 2 and 3 a and have commenced upon lot 3. For the most interesting part of this lot viz. the *Cereus* Scolytid and the pill box with subtile *Cereus* beetles I have to wait for a clear Sunday morning before I dare to mount these delicate and rare species; but I have mounted some of the *Cereus*-fauna duplicates. I see that among

your *Cereus Hololepta* you have 3 species; 1st the large *H. yucateca*, 2) the small *H. vicina*, Lec. (in my preliminary list incorrectly mentioned as *H. cacti*) and 3) the true *H. cacti*, one specimen of which was among the duplicates of *H. yucateca* collected Dec. 29 and 30th. It is much smaller than the largest specimens of *yucateca* but only a little smaller than the smallest *yucateca*. It has always one *entire* elytral stria, the propygidium is without smooth, shining median area, the mentum has on each side an undulating carina and the prosternal ridge projects anteriorly in a very acute point.

(I shall continue this letter this evening)

Yours ever

E. A. SCHWARZ

Washington, D. C., Jan. 20 '97

(Continuation of letter written this afternoon)

Dear Hubbard,

I have also not only mounted the many hundred *Cereus Aleocharids* of lot no. 2 but carefully looked at each and every specimen. The species found by me are as follows: 1) the giant species, *Maseochara semivelutina*; 2) next in size, *M. valida*, entirely black 3) Smaller species, *Maseochara* sp. with very opaque thorax and red elytra; 4) of the same size as No. 3, *Maseochara* sp. thorax opaque, elytra reddish with oblique dark stripe; perhaps not specifically different from No. 3; 5) the smallest species, *Atheta (Homalota)* n.sp.; not opaque, black above. base of antennae & legs pale; varies in size. All these are represented by large series of specimens but I succeeded to my surprise in finding 2 specimens of a rather remarkable 6th species, apparently also a *Maseochara*, black with very short elytra which have a faint yellow apical spot. In size this species is slightly longer than No. 3 or 4 but much smaller than no. 2. I think it will be next to impossible to recognize this rare species while it runs about among the hundreds of the other more common *Aleocharids*.

Toumey's pinned *Coleoptera* have arrived in good condition. I shall gladly name and return everything (or at least a specimen of each species)—none of them are looking very inviting—as

soon as I learn of your return to Tucson. I shall also gladly prepare for him a set of your duplicates and what we can spare of Morrison's collecting. His "*Eurymetopon rufipes* Eschscholtz" has been found by you abundantly under Mesquite bark.

Whether or not the fauna of the Screw-bean, *Prosopis pubescens* (formerly *Strombocarpus*) differs from that of the common Mesquite, *P. juliflora* is not known but the Bruchid infesting the seeds are identical.

A box of cigars is herewith mailed to you and I hope you will get it safely at the general delivery window of the postoffice. This request is the only indication from which I infer that your health is in desirable condition for, otherwise, you would not write for cigars. I regret that in your letters you are so silent in regard to news of yourself; nor have you written me a word what news you have of your family.

I wrote you to Tucson on Jan. 10th and 11th (or 12th?), two letters, which you had not received when you wrote your letter of the 15th.

Heidemann is coming to me next Friday evening when we will have a conference anent the Arizona Hemiptera. Your collection from Heteroptera from desert plants contains a number of beautiful small species, some of them I have never seen but the best ones being represented by only one or two specimens each. The small bed-bug (Anthocorid) of the *Neotoma* cannot be named here in Washington and will be sent to Uhler. How many of the *Cereus* Hemiptera are really peculiar to this plant or to Cactaceous plants in general, it is impossible to say at present since no attention to the life habits of western Heteroptera has ever been given. However, observations during spring and summer will easily clear up these uncertainties.

This evening there will be an exciting meeting of the Joint Commission of the Scientific Societies of Washington held for the election of new officers. The Geologists and Chemists are at work against Mr. Gardiner Hubbard the present president of the Commission and president of the National Geograph. Society because he is not strictly a scientific man. He is, however, a very rich man, one of the regents of the Smithsonian Institution and if he should not be reelected there will be a great row.

P. S. I have just opened the pill box containing your collection of the past week. The "spotted Melandryid" from the Polyporus unfortunately proves to be a Mycetophagid, the widely distributed *Litargus balteatus*, but in compensation of this disappointment I notice in the box one specimen of the rare (and new to us) *Diaperis rufipes* Horn described from Camp Grant, Ariz. "under cottonwood bark." The two Otiiorhynchidae are very good, the "Copturus like species" is Casey's genus *Elissa*. The "Cryptohyphus" is a *Horistonotus* which I do not see in our collection. Two specimens of a *Dorytomus* had come to life again (!!) and were walking about in the box. Look out for your cyanide!

Yours ever,

E. A. SCHWARZ

Washington, D. C., Jan. 21/97

Dear Hubbard,

Still another box containing the Lamellicorn larvae from Dasyllirion arrived this morning. The larvae appear to be in good condition but it will hardly be possible to breed them here; for even if they are full-grown they will not pupate before several months. It is almost certain that they do not belong to *Lachnosterna* or *Listrochelus* but they may belong to the Dynastini and possibly to the genus *Phileurus*. If so their mode of living would be in conformity with that of the known species of this tribe though of course I can not explain how they got in the interior of the Dasyllirion trunk.

To my great surprise your Dasyllirion Calandrid turns out to be a *Yuccaborus*! which are recorded only from *Yucca* stems. In our collection we have only one specimen from New Mexico and several others belonging to an undescribed species from Brownsville, Tex. Since your specimens are in fragmentary condition I cannot tell whether they agree with *Y. frontalis* Lec. which was discovered by Croteh in *Yucca* stems in the Mohave Desert of California.

I do not know how long you intend to stay in California nor whether your ticket allows you to stop over at Los Angeles or some other points. Coquillett says you would enjoy greatly a

short stay at Palm Spring in the Desert where there is a good hotel and where you would have an opportunity of seeing the native palm trees of California, *Washingtonia filifera*. In the dead trunk of one of these trees the giant Bostrycid, *Dinapate wrightii*, has been discovered. Coquillett also gave me some addresses: In San Diego there is no Entomologist but Mr. C. R. Orcutt (he lives at Orcutt which is a suburb of San Diego) is a noted florist and seed dealer well acquainted with the wild plants of the desert. Coquillett says he is a crank but may possibly drive you out in the desert to show you the Washingtonias. At Los Angeles there is Dr. A. Davidson (119 1/2 South spring St.) a good entomologist who writes about the habits of bees, and is corresponding with Coquillett and Ashmead. He would certainly be glad to make your acquaintance and show you the best localities near Los Angeles. Dr. E. C. VanDyke of Los Angeles (Dr. Davidson could give you the address) is said to be a young Coleopterist and a nice man. Mr. John Scott, the County Horticultural Commissioner, room 11, Court House, Los Angeles is a well informed man in orange culture and insects of the orange; he has a splendid orange grove. There is further Mr. H. C. Fall, the Coleopterist of Pomona (not very far from Los Angeles) and finally your old friend Prof. A. J. Cook at Clairemont near Pomona.

Another letter evidently containing a check of the Western & Lackawanna R. R. Co. arrived for you this morning and has been forwarded by me to Mrs. Hubbard.

Dr. Merriam read with great interest your account of the mouse and rat's nest in Dasyllirion and had it at once copied. This morning he came over to my office having the identical specimen of the Dasyllirion mouse that has been killed by you and which has been sent to him by Mr. Brown. Its name is *Peromyscus eremicus*. Merriam also says that the *Neotoma* from Dasyllirion is probably different from the plain inhabiting species.

Do not fail to let me know how long you expect to stay in California so that our correspondence should not become more disarranged than it is at present partly on account of the great distance and partly by the mismanagement of the Tucson post-office. I would also beg you to number your invoices, even the

smaller ones, so that they can be easily referred to in corresponding. I have numbered your last invoice which came yesterday and to which I referred shortly in my yesterday's letter, No. 4

Yours ever,

E. A. SCHWARZ

P. S. Two microscopic slide boxes are herewith returned to you under Dep't frank.

Washington, D. C. Jan. 22/97

Dear Hubbard,

There is no end of new species among your *Cereus* insects! In your lot 3 there is a pill box with "duplicates" containing many hundred specimens of the *Cereus* Hydrophilids Staphylinids and Histerids. One or several specimens must have come to life again and some damage has been done to the antennae and legs of the more delicate specimens. On account of the multitude of specimens and the breakage the box did not look very inviting but I resolved to tackle it right away in order to dispose of it. Although for three evenings I have been working hard at this box I have not yet mounted one half of the specimens but I have been rewarded by finding some very interesting things among the so-called duplicates. It was among the *Hololeptus* in this box that I found the only specimen of *H. cacti* of which I wrote you lately. Among the multitudes of *Physetoporus grossulus* I finally found a specimen of the missing *Erchomus inflatus*, and there may be more specimens in the box. It is somewhat smaller and stouter than the *Physetoporus* and of a dark reddish-brown, never black, color above. It is twice the size of *Erchomus punctipennis* with which it cannot be confounded. Then I found several specimens of that rare, rather small *Maseochara* I wrote you about recently and of which there were only two specimens in your lot 2. Finally, yesterday evening I made still another interesting discovery in the same box by finding another Hydrophilid, new to the *Cereus* fauna. It is a new species of the genus *Megasternum*, of the same size as the little *Pelosoma capillatum* so abundantly found by you but more brownish in color, less shining, the elytra with stronger and more impressed lines of punctures and with a broad and

elevated posternum. Whether in collecting this new species can be readily distinguished I do not know but I suppose it will be common in other localities.

These are several obscure points connected with this interesting *Cereus* fauna: 1st) is it really true that the holes in the *Cereus* trunks are really made by the woodpeckers for the sole purpose of storing seeds? Should it not be possible that these birds are looking for insect larvae boring in the hard rind? This brings up the second question: is a healthy *Cereus giganteus* ever attacked or bored into by insects or their larvae? Of course all these questions cannot be answered by winter observations but if you are still in the *Cereus* region late in the spring you can probably throw some light on these points. Mr. McGee, the ethnologist, who is, however, neither a botanist nor an entomologist, alludes in his "Expedition to Seriland" (which is in Sonora—along the Bay of California) in a mysterious way to the "Cereus insect" and its relation to the plant. I have copied a part of his account and inclose it herewith. It is impossible to find out what he can mean but perhaps Prof. Toumey is able to give you a little more information, on this point.

Yours ever,

E. A. SCHWARZ

Washington, Jan 25/97

Dear Hubbard,

I have your letter of the 17th from which I see that you got my letters of the 10th and 11th acknowledging the receipt of your lot 3. I wrote you also on the 12th or 13th and returned 2 boxes with specimens given you by Brown and Toumey. Since that time I wrote you one letter to Yuma and various others to San Diego but I am afraid it will take some time before you get all these letters together unless you have carefully instructed the postmasters regarding forwarding resp. retaining your mail. I also sent to San Diego some empty boxes and a box of cigars. I hope that the climate of the Pacific coast will not interfere with the improvement of your health and that you will enjoy the novel scenery. Do not fail to let me know in time how long you expect to stay in Cala.; and in case you have stopped over

at Yuma I am of course very curious to learn of your experience. Dr. Edw. Palmer has lately returned from Durango, Mex., and I enquired of him regarding the country at the mouth of the Colorado but he gave a most dismal account; there is nothing down there but shifting sand banks and a few salt marshes (with a very peculiar rice-like grass), the only remarkable thing being the tremendous surf at the bar.

On Friday (22nd) evening Mr. Heidemann came to me and looked over your Hemiptera. He admired greatly your small species from Mesquite and desert plants but was not particularly struck with the Heteroptera from *Cereus* excepting a rather small yellow Pentatomid near *Euschistus*. I gave him a good set of the duplicates and hope soon to be able to send your names. The small bed-bug parasitic on *Neotoma albigula* is certainly something of great interest; I made it out to be an Anthocorid and waded through the entire Monograph of Reuter's without finding it but Heidemann thinks it could be a winged Acanthiid. I have now sent a few specimens to Uhler. Some considerable doubt has also arisen regarding the determination of your *Conorhinus* larvae and pupae. It may turn out that all records of the occurrence of *C. sanguisuga* in Arizona are incorrect, and that the true *sanguisuga* has spread from Mexico into the U. S. by way of lower Texas and not by way of Sonora and Arizona. The South Californian species is an apparently undescribed species (unless described from the West coast of Mexico but there are no Arizona specimens (imago) in our collections here, nor have we any larvae and pupae of the Californian species. Thus we cannot ascertain whether or not your species is identical with that from southern Cal. If you could connect the pupae from *Neotoma* nests with the imago by breeding or otherwise all doubt would be removed.

Yesterday I mounted a large lot of that *Cereus* Scolytid but am still greatly puzzled about this marvelous species. I see now that the difference in sculpture is due to a peculiar exudation or incrustation which fills up the punctures and obliterates the elytral sculpture but the differences in the form and position of the cephalic horns of the ♂ I fail to understand. If the material represents a single species it must be assumed that as long as

the beetle is immature the horns are curved and recurved over the thorax and that when it gets older the horns straighten and become erect or even porrect. Have any of your pupae the horns erect?

As to the mounting of your duplicates I would say that no matter how many of them it would not cost much time to mount them if they could be undoubted duplicates but referring you to my last letter you can see that interesting and even new species can be found in a box with so-called duplicates. At any rate since my last letter I have made good progress in mounting and I commence to recover my courage.

The whole of your lot 4 is now mounted. Of special interest are the *Araeoschizus* found under stones Jan 4 and 14th. There are not less than 3 species among them 1) *A. regularis*—each elytron with 4 ridges, interstices biserially punctured, elytra without erect setae or erect scales—2) *A. n. sp.*—each elytron with 4 ridges, interstices biserially punctured, elytral costae with erect setae—3) *A. costipennis*—each elytron with 7 ridges less elevated, interstices uniserially punctured, elytral costae with recurved hairs.—This is an unexpected addition to our collection, since No. 3 is new to it and of Nos. 1 and 2 we had one specimen of each. Wickham found at Tucson (in June or July) still another species, *A. finibriatus* which generally agrees with your *A. n. sp.* but has a deep longitudinal thoracic sulcus. A fifth Arizona species, *A. decipiens* collected by Morrison (precise locality unknown) is in our collection; it is closely allied to *A. costipennis* but much larger and without recurved hairs.

Your "Cryptohypnus" is *Horistonotus pullatus* described by Horn from Morrison's collecting. Various similarly colored Cryptohypnus-like Elaterids are likely to occur at Tucson or in the mountains near by. They are all rare in collections but no true Cryptohypnus of this size has been found in Arizona.

Of the two Otorhynchids found under stones Jan. 9 and 14th, the smaller, shorter one (I suppose this you called "Neoptochus") is not in our collection and appears to be undescribed. It is really allied to Neoptochus. The second, larger, more elongate species of which you found a large number of specimens is *Elissa laticeps* Casey, described from El Paso, Tex. A second,

so-called species of the same genus was described by Casey from Yuma, Ariz.

Among the rather small, brownish black, elongate-oval Tenebrionids which you find so plentifully under Mesquite bark and scale of Cactus there are two species, both belonging to *Eurymetopon* (the genus may be recognized by the form of the anterior tibiae, the outer angle of which is prolonged), the larger one is correctly named in Toumey's collection *E. rufipes* Eschsch. described from San Diego. The second species is much smaller and more elongate and I have no name for it yet. Of the closely allied genus *Emmenastus*, which has the front tibiae simple you have hitherto sent two species (not yet determined) one among the *Cereus* things, collected Dec. 30th, and the other found in debris of cactus, Tucson Mts. Jan. 14". The little *Blapstinus* (two specimens found Jan. 9th, one being dead and eaten by a spider) is not in our collection. Several species of this difficult genus will no doubt abound in specimens near Tucson in sandy places later in the season.

The "Baris or Centrinus" (one specimen found dead Jan. 9) is *Onychobaris mystica* of which I wrote you in one of my former letters as possibly occurring near Tucson on *Opuntia leptocaulis*. I succeeded in cleaning the specimen from the adhering spider's web.

The *Yuccaborus* from *Dasyllirion* agrees with our specimen from New Mexico and is doubtless *D. frontalis*. The fragment of the large *Cereus* Calandrid belongs to *Cactophagus validus*. Two other Rhynchophorid fragments in one of the two match boxes belong to *Eupagodores decipiens* of which two good specimens were found by you before.

The Chlamys found on Jan. 7th is not the common *C. plicata* (though this occurs also commonly in Arizona but *Chl. memnonia* Lac. which is the type of the famous genus *Diaspis* Lac., the only genus in Coleoptera which has two scutella, i.e. the meta-notum becomes visible behind the true scutellum between the elytra. Subsequent observations have proven that this character is not a constant one and the genus has been abandoned for many years but it is revived by Jacoby in the *Biologia Centrali-Americana*. *C. memnonia* does not seem to be rare in southern Arizona for it was abundantly found by Morrison.

The *Cereus giganteus* insects sent along with your lot 4 and collected on Jan. 14th did not contain anything new. Among the *Physetoporus grossulus* there was no *Erchomus inflatus*, but of course the beautiful *Xanthopygus cacti* is still most acceptable. However, the Termite from Giant Cactus (Your No. 14) is a really wonderful species, mainly on account of the antennae of the soldier which are only 9-jointed and have the 3rd joint enormously elongated and clavate. I think that the pale, blind specimens represent workers and thus the species can not belong to *Calotermes* but must belong to *Termopsis* or a new genus. Winged specimens are greatly desired.

The flea and the mite of the *Dasyllirion* mouse nest I have turned over to the Department for determination; the flea will be sent to Mr. C. F. Baker who has made a specialty of the study of fleas and Mr. Banks will try and name the mite.

The beautiful *Diaperis rufipes* (new to our collection) found by you Jan. 10 is unfortunately minus legs and antennae, no doubt long since dead when found. I hope you will find living specimens in the spring. The two "Anthonomus" in dry fungus on Cottonwood, same date, belong to an unnamed species of *Dorytomus* which you will find commonly on Cottonwood trees or calkins in the spring. They were alive when the box arrived but there was something else alive in the box which alarmed me and which you did not collect knowingly, viz. 5 specimens of *Silvanus surinamensis*. Where they did come from I do not know, but presumably from the body of the Asida, placed by you in the match box and which was evidently dead when found by you.

Yours ever,

E. A. SCHWARZ

Washington, D. C. Jan. 26, 1897

Dear Hubbard,

Your letter of Jan. 20th giving a most interesting description of Yuma and its surroundings came to hand this morning. It must be a queer country and the scenery along the Colorado River must form a striking contrast to that you have been accustomed to at Tucson. From the entomological standpoint your

account is not very encouraging since the most favorable locality, viz. the bottom land and the river banks seem to be rather inaccessible on account of the freshets. As I wrote you before, a great many species of Coleoptera have been described from Yuma but perhaps not so much on account of the favorable locality as because all entomological visitors to Arizona stopped at this point. However if the climate agrees with you and if you are satisfied with the hotel fare, the surroundings and especially with the entomology I think you would be wise to stop over again upon your return from San Diego.

We had at the Department several times Screw beans (*Prosopis pubescens*) but as far as I remember never had anything from them except the common Mesquite *Bruchus* (*B. prosopis*) and a new species of the same genus (this from pods sent from San Diego), but LeConte and Horn record *B. desertorum* and *B. uniformis* from screw beans. No *Anthonomus* has ever been bred from these beans but it is quite possible that a species lives therein.

The plant you inclose has been named by Coville *Pluchea servicea* (compositae). This he says is the correct name but the plant is also known as *Tessaria borealis*, the specific name indicating that it is the northernmost species of a tropical genus. The weevil you found on this plant puzzles me greatly. If it is an Otiorynchid it must belong to *Cyphus* of which two species are known from Arizona (no exact locality recorded; we have one, *C. lautus* from Morrison) for besides the desert genera *Ophryastes* and *Eupagoderes* no other large-sized Otiorynchids are known from Arizona. But then your description does not "function" at all with the two *Cyphus*. If it is a true Curculionid I cannot even guess at the genus.

The *Dysdercus*-like Hemiptera from milkweed belong all to the genus *Lygaeus*; the species you sent before looks very much like our common *L. reclinatus* which abounds here on *Aselepias*.

I see that you sent to Howard a box with some decaying pulp of *Cereus giganteus*, and the consequence is that Pergande's insectary swarms with the *Dactylosternum*, *Pelosoma*, *Paromalus* and the Staphylinidae. Pergande's object is to breed the *Volucella* but he has already satisfied himself that it is *Volucella*.

avida O.S. Of the same species you sent with your invoice 3a a puparium found in Cactus and the fly has hatched here.

I have to take back everything I said in my last letter on the Termite from *Cereus*. It is simply *Calotermes castaneus* and what I considered as workers are simply the larvae of sexed individuals. The soldier of this species has never been described.

I am of course very curious to know whether the Colorado River will give up to you some of its entomological treasures, and I also hope that you will have escaped that terrible cold wave which is now upon us. From Bulletin No. 20 of the Arizona Agricult. Exper. Stat. entitled "Arizona Weather" I see that the mean temperature of February (at Tucson) is perceptibly higher than that of January but low temperatures and rain may still be expected. The real spring with a temperature fit for camping out does not commence before April.

Yours ever

E. A. SCHWARZ

Washington, D. C. Jan. 30, 1897

Dear Hubbard,

Your exciting account of the Colorado River bottom exploration reached me this morning with the tin box containing screw beans and Tachardias, and the registered box I found in my house two hours ago after return from office. Of course I at once opened the boxes to see whether anything had come to life again but the contents seem to be allright. Now, you can not expect that I can give you right away a complete list of this astonishing array of coleopterological treasures you have brought together within a few days. The mere aspect of the topmost layers (I do not dare to dig deeper in the boxes at present) is overwhelmingly grand, even colossal or rather pyramidal. Tomorrow being fortunately Sunday I expect to do a good deal of mounting and if I am not troubled by unexpected visitors I hope to give you tomorrow evening a rough preliminary account. For this reason I abstain to speak now of the many varieties and novelties which my eye caught upon opening the boxes. I merely wish to mention that your large weevil on *Pluchea sericea* is to my great surprise *Centrocleonus molitor* Lec. I was not

aware that any species of the *Cleonus* group could be found in abundance upon a particular plant at day time.

Among the screw beans one *Bruchus* was found to have hatched. It is quite different from the common Mesquite species (*Bruchus prosopis*) and for the present quite unknown to me.

The *Tachardia* is not in the collection of the Department and according to Pergande a new species.

In your letter you refer to various things which you have written to me but since your letter of Jan. 20 I received nothing from you until your letter of the 24th. I would be very sorry if a letter from you written about Jan. 22nd should have been lost.

I have put one of your boxes to soak and have now to mount the contents. More tomorrow.

Yours ever

E. A. SCHWARZ.

Washington, D. C. Febr 1/97

Dear Hubbard,

Last Saturday I acknowledged briefly the receipt of your letter of the 24th and of your grand Colorado River collection and this morning (Monday) I got your letter of the 25th. The most welcome news therein is the gratifying account of the state of your health, and I do not see any reason why your lung trouble should not disappear entirely before next summer under the influence of the Arizona climate and of your constant outdoor exercise. I was also glad to stand corrected as to my views of the Arizona winter climate; that weather Bulletin issued by the Ariz. Agric. Exper. Station from which I gathered my information seems to be somewhat misleading.

I am at a loss to locate the parasite you found in the dead wasps (*Myzine* sp.) It cannot possibly be a Meloid for their larvae are, strictly speaking, not parasites and are predaceous, living first on the egg and then on the honey of bees. It cannot be a ♀ of a Stylopidae, for any Stylopidae would die as soon as its host dies. I do not dare to investigate closely the contents of the dead wasps for fear of injuring the parasite and only hope that we will be able to breed it. It may be a Conopidae (Diptera) larva.

Saturday evening and the whole of yesterday (Sunday) until 12 o'el. midnight I spent in mounting your Yuma collection but in spite of the most assiduous work I succeeded only in mounting the contents of the two boxes with small and delicate things, that of Jan. 21st and the corresponding box of Jan. 23rd. Both contained an astonishing number of specimens and the number of species represented by them is unusually large. But still more astonishing is the large number of species which I never saw before, and these two pill boxes alone constitute a large and important addition to our collection. For want of time I am utterly unable at present to give you anything like a list of your species and must confine myself to a running comment of the species mentioned by yourself in your letter of the 25th. I will merely add that several of the rarest species are not mentioned by you, e. g. a new genus of Murmidiidae (near the Colydiidae) which is a most inconspicuous, little, round black beetle, greatly resembling the Floridian *Scymnus utilis* (which feeds on *Aleyrodes citri*), *opaque* and *hairy* and not to be confounded with a new *Clambus* (contractile, very minute Silphid) and a new *Cybocephalus* (contractile, SHINING black) of your collection, nor with a small *Scymnus* beaten by you from shrubbery Jan 20th.

The "large *Clivina*," 1 spec. Jan. 22nd is evidently not different from the common *C. dentipes* but has originally been described by LeConte from Yuma as a distinct species. The "*Palaminus*" mentioned by you I cannot find; should you mis-

(I meant *Pinophilus* H.)

take for it a common *S*—— (S. longi ——) which you took frequently on Jan. 21, 22 and 23rd? A *Palaminus* (*pallipes*) has been described by LeConte from Yuma and is not represented in our collection.

"Small *Chlaenius* . . . with orange elytral spot" is *Ch. ruficauda* Chaudoir, a common Mexican species extending into Arizona where it has not often been collected. We have only one specimen in our collection without locality.

"Larger *Chlaenius* with white legs" is *Ch. leucoscelis* Chevrolat, not rare and rather widely distributed in the U. S. and Mexico.

"3 specimens of a small clearbrown Tenebrionid from top of a barren hill" is *Anepsius delicatulus* Lec. which extends from Southern California to western Texas. It cannot be rare.

"Large white Heterocerus is *H. gnatho* known only from So. Cala and adjacent parts of Ariz.; the smaller spotted species is *H. collaris*, widely distributed; the still smaller very pale species is *H. pusillus*, also widely distributed. All three species are, however, much whiter than any other I have seen.

The Dyschirius have not yet been investigated; your "smaller Clivinas" belong to *Schizogenius* (2 species) which genus is readily known by the longitudinally sulcate head.

Of your Aphodiidae none belong to the genus Aphodius but they are all Ataenius not yet studied; one of them, a very elongate one, (1 specimen) looks strange to me.

The Blapstinus has not yet been investigated.

That the fauna of your Colorado River bottom is not exclusively composed of varieties is shown by some of your Chrysomelidae: there is the cosmopolitan *Crepidodera helxines* Linn. (bright golden green with yellow legs and antennae); and your "Metachroma" which is the common Strawberry leaf-beetle, *Paria sexnotata* (or *Paria aterrima* when entirely black); the Disonychas also look very common though among these striped species Arizona possesses one peculiar species.

Your "Macrops" from willows is a Dorytomus which has also been found by you at Tucson. Most of your "smaller Curculionidae" will be *Anthonomus pauperculus*, found by you at Tucson in number.

Your Anthicidae are all good but I think you will find them in greater abundance and additional species later in the season when the river is low. The "black one with two yellow elongate spots on the elytra, one on each side" is *A. tenuis* Lec., described from Yuma and new to our collection. "The still more elongated and ghost-like in form, testaceous, variegated with black" is the true *Mecynotarsus delicatulus* Horn which since LeConte's time has never been found again; new to our collection; I was most delighted to see this, for it enables me to describe intelligently my new species from San Diego, Texas. Your "perfectly colorless Mecynotarsus" is either a new species or a variety of

M. delicatulus. I hope you will be able to get more specimens of these two *Mecynotarsus*; later in the season they should be not rare on the dry sand banks (though very few entomologists have been able to find the species of this genus).

Your "*Listrochelus*" are one or two species of *Diploaxis* about which nothing can be said at present. You will find various other species of this genus. The true *Listrochelus* greatly resemble small *Lachnosternas* and will be found flying at and after dark later in the season.

The "stout *Aphonus*" is I regret to state the common *Ligyris gibbosus*. Some larger and very little known allied species are, however, liable to occur in southern Arizona.

The *Tropisternus* is the same common species you found at Tucson; the small *Philhydrus* may be something good; the *Lacobioides* is *L. ellipticus* but there are among them two species of a *Chaetarthia* which may be different from the eastern *C. pallida*.

The small Carabidous species so plentifully represented in your collection is not yet investigated; it suffices to say that your *Bembidiums* do not represent a very striking appearance but I notice among the small ones a unique example of a distinct species. Three species of *Tachys* are abundantly represented but of a 4th species pale HONEY yellow, DEPRESSED with LONG antennae, evidently something extraordinary, I see only one specimen.

The "elegant very small black *Lebia* with a spot on the elytra" is the widely distributed *Axinopalpus biplagiatus*.

Now to your great prize in the Carabidae! They are really extraordinary. Of the two "*Zuphium*," the smaller, with large head, less punctate etc. is *Z. mexicanum*, new to us; the larger one with evident punctuation is a *Thalpius* not yet determined and also new to us. Neither of these two were found by LeConte at Yuma. The small "Carabid not shining with pellucid appearance" is the rare *Pericompsus sellatus* Lec. described from Yuma. We have 3 specimens given by Capt. Casey labeled "Cala". but probably collected at Yuma.

The *Brachinus* is not yet investigated but it belongs to the Pacific series of this group.

The snow-white *Eumolpid* is the best preserved specimen of *Glyptoscelis* I have ever seen; it is *G. squamulatus* known to

occur in So. Cal. and Ariz. The smaller allied species is *Myochrous longulus* Lec. known only from Yuma.

Of the rest of your collection I shall write tomorrow and only mention here that your "brilliant orange-red colored Staphylinid like a *Paederus*" of which you took a good supply is *Paederus ustus* Lec. known only from Yuma. To this species I called your particular attention on the last day you were at Washington and showed you then the specimens in our collection given by Capt. Casey.

I have now to go to work to mount another lot of your Yuma things which I put to soak before commencing this letter.

Yours ever

E. A. SCHWARZ

Washington, Febr 3/97

Dear Hubbard,

Before all I must congratulate you upon your splendid success in bringing to light the fauna of the Colorado River bottom. I have thus far received (and fortunately almost entirely mounted) only the lot you sent with your letter of Jan. 24 (this lot I have numbered No. 5) and to which I referred in my last letter. Since that time I have received your letter of Jan. 25 and this morning came your letter of Jan. 28th both referring to the continuation of the river bottom investigation. From your immense collection I perceive now that the fauna of the lower Colorado River valley is not only much richer in species but also of much greater importance for the knowledge of geographic distribution than it has hitherto been accepted and your collection alone fully confirms Dr. Merriam's claim for the lower Colorado valley as a distinct faunal region. As I wrote you before there are many previous records of species taken at Yuma but with many other species the records have been confused and obscured by careless labeling and the species have been described simply from "Arizona" or "California." Your collection contains a large proportion of species which no doubt are peculiar to this fauna but many more remain to be discovered, for, in spite of the warm weather you boast of, your collection has a decided winterly aspect and the phytophagous families which

contain the species most characteristic to a tropical fauna are not represented. There are hardly any Elateridae, no Buprestidae, no Lampyridae, no Malachiidae, hardly any Ptinidae, no Cerambycidae, no Meloidae, hardly any Chrysomelidae and Curculionidae. All these will come later and will represent many peculiar forms.

To continue my report left unfinished in my last letter:

"The largest Philonthus, dark species with red elytra" Strange to say, this is not in our collection and may be undescribed.

The Pinophilus is *P. densus*, new to our collection, described by LeConte from Yuma.

"Brilliant orange red Staphylinid like a Paederus" is *Paederus ustus* Lec. as I wrote you already.

No *Homalotas* are among the lot but a *Tachyura* (good looking species) *Aleochara bimaculata* (cosmopolitan); a small thing allied to *Aleochara* with the ♂ having a concave thorax (apparently new to us; a new species of *Myrmecochara* (a very short, light brown, rather hairy species, strictly myrmecophilous).

Among the *Steni* are two, possibly three, species, the largest with yellow legs, is *St. gilae* described by Casey from specimens collected by LeConte probably at Gila Bend.

The very minute pallid *Hypocyptus* I have unfortunately not yet found but may still turn up.

The "very abundant Pselaphid, very small, exceedingly short and stout" is *Scalenarthrus hornii* Lec. (the genus and species is new to our collection) described from specimens found by Dr. Horn at Camp Grant.

"One specimen of the *Trimium* which I found so common under willow leaves on the opposite shore" There is not a single specimen of *Trimium* in the lot, but numerous specimens of the Lathridiid *Holoparamecus pacificus* Lec. which has no doubt been mistaken by you for a *Trimium*. The same species is (2 specimens) among your beetles from *Cereus giganteus* and is apparently referred to in one of your letters as an *Enthia*. Among this *Holoparamecus* there were also several specimens of a *Smicrips* which probably does not differ from the Floridian *S. palmicola*. Of the *Holopar.* we have two specimens from the Morrison collection.

Of the 3 species of "small, round black beetles"—*Clambus* n. sp.;—*Cybocephalus* sp.; new GENUS of Murmidiidae—I think I wrote you before.

The Hemiptychus is different from our eastern species but in nowise a striking species. The "Throseus with hoary pubescence" is one of Californian species, its hoary pubescence proved to be a mixture of river mud and ordinary pubescence.

Of the species mentioned by you in your letter of Jan. 25th I would guess that the Ega must be *E. laetula* which is not in our collection.

Species mentioned in your letter of the 28th: Of Scarites we have only one species in the U. S., *S. subterraneus* which, however, develops marked geographical races.

The "Listrochelus" mentioned by you before is always a Diplotaxis of which various species will be found by you in Arizona.

The "very large black Saprinus" will be nothing but *S. lugens* which is common throughout the southeast. "The very small, brown Histerid without striae" I take to be *Abraeus bolteri* Lec., a rare species of which one specimen was given us by Mr. Fall.

The Platynus I cannot name with certainty; the only dull blue species from Arizona in our collection is *P. funebris* Lec. I regret that I have not yet any name for your common brownish *Blapstinus*. The 12-spotted pea-green Diabrotica is *D. tenella* Lec. considered as a race of *D. 12-punctata*. Your *Galerita lecontei* may be *G. californica* Horn which would be new to us.

I forgot to mention that besides the Scalenarthrus and the Ctenistes there is a third Pselaphid in your collection viz. a Bryaxis, probably *B. texensis* Brend. which is new to us. *Bius estriatus* does not occur in Arizona but I cannot make a guess at it and just so I am unable to tell what your rare Tenebrionidae and Curculionidae are. With your Cereus species it was a comparatively easy thing to guess at the species because we had to do with a definite food-plant but with Tenebrionidae and Otiorhynchidae it is quite a different thing.

I wonder what experience you will have in California. If you find time to devote to entomology you will find of course many species which are unknown to you but the proportion of "good

things'' you will turn up will be much smaller than from Arizona for the San Diego region has been hunted over by Coleopterists: LeConte, Horn, Crotch, Koebele, Casey, Coquillett, Blaisdell etc. Ulke got quarts of beetles from San Diego which were collected by a gentleman, Mr. Sanford, who was City engineer of San Diego but of whom nothing has been heard from of late years, However I believe that by ''thorough'' collecting some unusually fine thing are still to be found there.

As you see from the enclosed sample of labels I had made some feeble preparation for your Yuma and San Diego trip. ''Yuma'' being such a short name I had to lengthen as best as I could but should you stop over there on your return trip I am afraid I have to print another edition.

I wonder whether you will find all my letters and that box of cigars. Let me know in time of your future movements so that letters and packages are not miscarried, and remember that it takes at least 10 days before you get any answer from me to any letter written at San Diego.

Yours ever,

E. A. SCHWARZ.

Washington, D. C., February 4, 1897

Dear Hubbard,

Upon coming home yesterday evening I found your box containing the second installment of the Colorado bottom exploration (this lot I have labeled lot no. 5a) sent with your letter of Jan. 28th. Unfortunately there was in the evening a meeting of the Joint Commission of Scient. Societies of Wash. which I had promised to attend. So I had only time to open the pill boxes and take a glance at the topmost layers. Still more unfortunately there is to-day the regular meeting of the Entomolog. Society (address of the President), and tomorrow night a lecture by Fernow on the ''Gardens, Forest, and Deserts of Arizona which I cannot miss. Thus I am unable to continue to work on your specimens before next Saturday. However, I made hasty notes on a few things I saw in the boxes:

The *Ega* is *E. laetula* described by LeConte from the Colorado River; he says ''not rare in March in wet places along the river''. New to our collection.

The "beautiful large iridescent Carabid" is *Pterostichus* (*Poecilus*) *subcordatus* Lec. (new to us) of which there was a single, less brilliant specimen among your lot No 5.

The Platynus is not *P. funebris* as I wrote yesterday but does not appear to be a rare species.

The more I look at your larger "Zuphium," which is probably a *Thalpius*, the stranger it appears to me. I was yesterday for a moment at Ulke's but did not see it in his collection.

The "very common looking Stelidota" is a *Cryptareha* (*Nitidulid*) which looks rather good and may prove to be different from the eastern species.

The "remarkable Tenebrionid, oval, covered with snuff-colored pubescence, and with alternate elytral ridges" is very remarkable indeed, quite unknown to me and I cannot place it at present.

The "short robust Lamellicorn dug out from the sand" looks very good; it may be a *Diplotaxis* but is quite different from that you found among the debris.

The "two specimens of a remarkably long-legged Otiornychid" belong to *Eupagoderes decipiens* of which you found two specimens at Tucson.

The "pretty little pale-red and translucent Tenebrionid from the top of stony hills" is something extraordinarily good; it is the rare genus *Batulius* of which two species were described by LeConte from the "desert of Gila" Possibly both species are represented among your specimens.

Your largest *Philonthus*, black with red thorax and elytra of which I wrote you has been located by me; it is the rare *Ph. innocuus* described by Horn from "Arizona" and new to our collection.

Among the very small things I am delighted to see a good supply of that new genus of *Murmididae* and of the new *Clambus*.

I am of course very anxious to send you a revised list of your *Cereus giganteus* fauna and of your Yuma collection but so far I have been too busy with mounting to have any time for determining. I shall, however, try my best and send you at least the Yuma list before you visit the place again.

I wonder whether I acknowledged to you the receipt of the bundle with sticks of *Prosopis* and *Larrea*. Nothing has come

out so far but something is working furiously in the Mesquite branches; in the Larrea twigs no life is visible though they look promising.

Yours ever,

E. A. SCHWARZ

Washington, D. C. Feby. 15/97

Dear Hubbard

After hard work I finished yesterday (Sunday) the mounting of everything you have sent on from Tucson and Yuma and intended to commence to-day a list of your Colorado bottom collection when this morning I received your grand Dinapate—Palm Springs—and Colorado desert letter, dated Feby. 8th with accompanying box of specimens.

This afternoon I spread out a little the contents of your box and found everything O. K. I do not propose to write now about the San Diego material in detail but merely wish to say that it is a most valuable addition to our collection since our material from lower Cala. is badly labeled and otherwise in undesirable condition. I am greatly pleased with the variety of species contained in the lot: that solitary Copturus is a beauty, evidently *C. mammilatus* Lec. which I never saw before and which is new to our collection. In my letter you will find at Indio I indulged in some guessing at this San Diego lot: one incorrect guess was that at the whitish Cureulionid you found so plentiful on a downy-leaved plant. It is *Trigonoscuta pilosa* Mots., a maritime species found all along the California coast but quite accessible to our collection, for we have not a single specimen with exact locality.

Now to your Palm Springs account! From the little I succeeded in extricating from Mr. Coquillett I knew that you would be pleased with the locality, and I only regret that you were not there 3 months later when according to Coquillett the desert and cañon plants swarm with insects. I regret that you worked so hard to get that Dinapate but your account of the habits and burrows is certainly worth a quart of the beetles even at \$1,300

apiece. The mere reading of your account is worth about half that amount. I take from your account that the larva bores in healthy trunks of Washingtonia ["No, but not in old dead trunks." Hubbard] Do you think that the beetle is peculiar to this palm? ["Yes." Hubbard.]

To go on with your account of your explorations in the Dinapate cañon:

“Large rich-deep-blue *Chlaenius*” = *Chlaenius cumatilis* Lec. peculiar to southern Cala. and most welcome to our collection where we had only a few miserable specimens without definite locality.

“Smaller dark (greenish) species of *Chlaenius* (1 specimen)” = *Chl. obsoletus* Lec. also peculiar to the extreme southwest. We have a few specimens from southern Cala. from Ulke, and from Kern Co., Cala. (Morrison.)

“Extremely abundant large flat *Platynus* brown with lighter thorax” = *Pl. brunneomarginatus* var. *bicolor* Lec. The typical form (entirely piceous-black) is common throughout Cala. The variety, which in the *Biologia Centrali-Americana* is considered as a distinct species is a southern race peculiar to southern Cala., Ariz. and Sonora. We have several from Ariz. (Morrison.)

“Most elegant, opaque, black *Platynus*” = *Platynus funebris* Lec. not rare in southern Cala. Under similar conditions you will find in Arizona an allied, more shining species, *Pl. cyanopsis* Bates.

“Small *Sphenophorus* about the roots of plants.” This is a beauty and apparently = *Sph. arizonensis* Horn, described from no exactly defined locality and new to our collection. The specimens coated with a dirt-colored covering, I take to be the same species.

“Tenebrionid under stones at mouth of small cañon, covered with coarse brown pubescence, thorax globular with sharp tubercles at front angles, etc.” This is *Craniotus pubescens* Lec., a genus new to our collection and a great rarity. Ulke has only one specimen and there are none at the Nat. Museum. Described

by Leconte from a single specimen found dead at Vallecita (some distance south of Palm Springs). Dr. Horn is the only one who found a number of them in the Maricopa Desert of Arizona under logs.

"Other Tenebrionid, long and parallel in form, black (glabrous), elytra striate and coarsely punctate, etc." = *Cerenopus concolor* Lee. of which Horn (Revision of Tenebrionidae) says: "Occurs on the borders of the Colorado desert and on the northern end of Baja Cala." It is evidently a very rare species of which there is only one specimen in our collection without any locality (given to you by Dr. Hagen). Among this species there is however in your lot ANOTHER species of the same genus (one specimen), slightly more flattened, the thorax wider and with the sides decidedly sinuate. It is quite unknown to me.

Not referred to in your letter but from the same locality and date there is an *Argoporis bicolor*, Tenebrionid, somewhat smaller than the *Cerenopus* and with red legs. We have it from Morrison's collecting from Arizona. There are further 2 species of *Eleodes*, one with spinous femora, the other very slender and extremely good looking.

Should this letter still reach you at Palm Springs please do not neglect these large Tenebrionidae of the desert land. Our collection is extremely poorly represented in this desert fauna and you may expect to find quite new species.

Yours ever

E. A. SCHWARZ

Washington, D. C., Febr. 10, 1897

Dear Hubbard,

Last Thursday the regular meeting of the Entomol. Soc. of Washington was held at Mr. Marlatt's new house. I think I wrote you that Marlatt got married last December to a girl with a mother who owned a nice house on Massachusetts Ave. A few days after the wedding the old lady was kind enough to die after a short sickness and Marlatt is now in the possession of a young wife and a fine house undisturbed by any mother-in-law. Last Friday Fernow's lecture on the deserts and forests of Arizona

came off. It was greatly interesting to me on account of the many beautiful and new lantern slides exhibited. Most of the views represented the forests on the plateau and San Francisco Mt. but there were also some of the slope of the "rim" (some distance south of Flagstaff) and a few from the desert region. One in particular interested me viz. a view of a large, cool brook in the Sta. Catalina Mts. bordered by a dense arborescent vegetation; this scenery must swarm with insects.

Last Saturday evening, the whole of Sunday and again Monday and Tuesday evenings I have been hard at work at your Yuma collection. I have made considerable progress but I am far from finishing the lot. The two boxes containing a multitude of small things cause great delay. New things are constantly turning up and the number of species represented in your Colorado bottom exploration will be much greater than you suppose. This fauna is evidently difficult to bring together on account of there being so many closely allied forms, i.e. species which cannot be distinguished while collecting. I think you will have noticed that nearly all Staphylinidae from the Colorado bottom are nearly the same coloration, being more or less bright orange-red, and it is among these that uniques most frequently occur. Thus I found among your duplicates of *Paederus ustus* a single *Lathrobium* which so resembles the *Paederus* that I almost overlooked it. Among the yellow Tachys I found 4 species, two of them represented by uniques, the two other by plenty of specimens. Even among the larger species I make unexpected discoveries. There is a third species of *Chaenius*, 2 specimens, greatly resembling the *Ch. leucoscelis*, and among your *Blapstinus* there are no less than 4 species, one being represented by a single specimen.

The largest of your *Bembidium* (strongly bronzed) is *Bembidium carinatum* Lec., described from the Colorado River and new to our collection. The larger *Blapstinus* like Tenebrionid with alternately elevated elytral interstices is *Trichoton sordidum*, described by LeConte as a *Blapstinus*. Horn says of it "not rare at Camp Grant, Ariz. under logs."

To my great disappointment I am obliged to withdraw all I have said about that new genus of Murmidiidae; it is simply the genus *Bothriophorus* of the Byrrhidae, described by LeConte as

Physemus minutus from the Colorado R.; but the genus was new to us.

I do not believe that while collecting in the Colorado desert you will be particularly interested in the Colorado bottom insects. I will, therefore, do my best to prepare and send you a preliminary list of this fauna to Yuma so that upon your return to the place you may find it there. It is of course impossible for me to calculate when you will get to Yuma but I hope to receive in your next letter further directions. I also would have returned you the empty boxes long ago but hardly dare it now as long as you are traveling about in the desert. Write to the postmaster of Yuma to retain any letters until you call for them.

Yours ever,

E. A. SCHWARZ

Washington, D. C., Feb. 19/97

Dear Hubbard,

I wish that the distance between the Colorado desert and Washington would be not so great, or at least that the railroad would run about 10 times faster than it does now; and secondly I wish I had a little more time to spend for the mounting and determination of your collections so that I could report on your insects quicker than I am able to do now and that you would get the information while you are still at the same place. I answered your first letter from Palm Springs and the first lot of the Palm Springs insects (lot 6b) as soon as I possibly could but I am no by no means sure whether my letter will still find you there. Since you intend to spend some days at Yuma I have made out a preliminary list of your collections there made between January 20 and 28 and have forwarded the same in 3 installments, dividing your collection into 2 parts, the River debris collections, and the collections made otherwise. The list may be of some use to you during your second stay; of course it has been made up hastily and the determinations are subject to corrections upon more careful examination.

Your first stay at Yuma was indeed a grand success, the whole number of Coleoptera collected by you in a single week amounting to about 200 species! among which there is an astonishing

large percentage of species new to our collection, and this number will no doubt be still increased upon closer study of the more difficult forms. If you stop over again at Yuma for some days I hope that you may get a little warmer weather so that you may see some of the spring species. Some easily recognizable and large species which must be common at Yuma at some season are not represented in your collection *e.g.* the genus *Omophron* (*O. gilae* Lec. "from the margins of the Gila River, Ar."; *O. dentatum* "on the banks of the Gila River at Yuma, Ariz.," and possibly also *O. oblitteratum*, a single specimen collected at Camp Grant, on the San Pedro, a tributary of the Gila, Ar."), the genus *Oodes* (*O. elegans* Lec. "occurs in Arizona along the banks of the Gila River") of which one species *O. elegans* is a brilliant species, dark bronze with golden-green margins. We have it from Morrison's collection and lately Mr. Fall gave me a lot found at Yuma. If the river is low you may find these things at the edge of the stream; other species not found by you before are sure to occur on dry, fine sand, especially at the roots of plants. But I am afraid that even at Yuma this dry sand fauna will be quite late to appear. The *Eleusis fasciata* is certainly not confined to Cottonwood bark and you may find it also under willow bark but only of rather freshly felled trunks or stumps where the bark still retains some moisture.

Your second letter from Palm Springs and second invoice (lot 7 which of course will be united with lot 6b) came to hand this morning. What a wonderful locality this oasis in the desert must be; I read your letter to Coquillett and he became quite enthusiastic in his praise of this locality which upon referring to his note book he visited early in May and when he and Dr. Davidson drove up to the cañon. I wish you would have a chance of seeing this place late in the season. I have spread out a little the contents of your boxes and while I see *many* things quite strange to me I am quite surprised at the character of the fauna. I expected that you would find almost exclusively desert forms but the largest portion of your collections consists of riparian forms! And what a difference between this fauna and that of the Colorado River! I cannot enter into particulars now but within 3 days (the 22nd is fortunately a holiday, Washing-

ton's birthday) I shall be able to give you more detailed information. Of course I duly admired your Dinapate, this almost antediluvian species which has no right to exist in our days. It is not to be desired that the specimen is, to express it mildly, somewhat damaged but if a perfect specimen is worth \$1300, I place the value of your specimen at about \$688.75. But now what to do with the specimen? I do not dare pin it and it is too big to glue it on paper.

Your Thelyphonus-like spider creates a sensation here. Mr. Banks has consulted the literature and suggests that it can enter the famile Schizonetidae of Thorell, allied to the Thelyphonidae. It is, however, a new genus and nothing similar has ever been found in Amerika. The peculiar anal appendage may be sexual.

Yours ever,

E. A. SCHWARZ

P. S. A box of cigars is herewith sent by mail;
also, under Department frank a box of large
vials, all addressed to Palm Springs, Cala.

Washington, D. C. March 5/97

Dear Hubbard,

After several days of anxious waiting I was extremely glad to receive this morning your letter of the 27th. The box has not come along but will probably be here tomorrow. You do not write about the state of your health but since you are climbing inaccessible canons and precipices I presume you have no reason to complain in this respect. I am glad that you find Palm Springs such an interesting and comfortable spot although I presume it was not a very pleasant place during those cold days with accompanying snowstorms. The only thing I regret is that I could not foresee your change of plans and that you will have some trouble in getting your mail. My last letter to you written some days ago in reply to your letter of Feb. 17 I directed to Tucson but I returned three slide boxes each containing 10 cigars (2 of them I think to Yuma) and also two packages with author's extras of your Ambrosia paper. Furthermore, had I known that you would remain longer at Palm Springs I could have worked at the determination of your Coleoptera from that place, but so I spent all my time over your Tucson material.

I am extremely glad that your exertions to find a colony of *Dinapate* have finally been crowned with success, and no matter whether or not Dr. Murray will be able to get the beetles this summer your observations are extremely valuable and well worth publishing. I have never seen a photograph of the *Washingtonia* and was greatly astonished in reading your account of the grandeur of the palm. Should your conclusion that *Dinapate* exclusively lives in this tree be correct, the species would form an exception to the polyphagous habits of most, if not all other species of the family *Bostrychidae*. I read somewhere that in the desert regions of California certain *Convolvulaceae* have enormous subterranean tubers which appear to me well adapted to furnish room and foot for large *Bostrychid* larvae. If the conditions under which *Dinapate* can propagate are so rare as you describe, I should think, the species would have become extinct long ago in California since I am not aware that there are anywhere large forests of this palm.

The remaining portion of your letter proved to be just as interesting especially the portion relating to myrmecophilous species. I fail to recognize any of these species and the same may be said of the other rarities you mention. As a rule I find that this Palm Springs fauna is much more difficult to identify from your description than the material you found at Tucson or Yuma; partly because there is absolutely nothing recorded from the Palm Springs regions and partly, as I wrote before, because the fauna there is so extremely composite. The "large gracile *Seydmaenid*" found among ants cannot be a *Cephennium* which are all oval or short-oval. The "red myrmecophilous *Staphylinid*" is apparently an undescribed species of Casey's genus *Platymedon* (near *Lithocharis* and *Dacnochilus*) of which I saw a Californian specimen in Ulke's collection. The "colorless *Bembidium*" is probably the really beautiful *Tetragonoderus pallidus* Horn of which I bought one specimen for 50cts from Wickham who found it at the Needles in Arizona. As I said there is no use for me to make further guesses and I shall wait until the specimens come.

Glad to see that you remember that lovely *Ptinus* from Yuma which had come to life in your boxes, as I can now label it cor-

rectly. I see that in the Yuma list I forgot to mention that one specimen of *Bruchus* n. sp. from Screw bean.

We are of course all upset here not so much on account of the enormous crowds which are here for the inauguration but in expectation regarding our new Secretary, Mr. Wilson of Iowa. He has been Director of the Iowa Agr. Exp. Stat. and if one would believe rumors he is just the same sort of politician as your friend Prof. Meyers of the West Virginia Agr. Exp. Stat. The new Assistant Sec'y, Mr. Brigham of Ohio is also a politician; so we do not know what the next future will bring us. There is also here a great gathering of delegates of the State Horticultural Societies from all parts of the country to confer about general legislation against the importation of injurious insects. Various entomologists, J. B. Smith, Slingerland, Garman of Kentucky and Atwood are among the delegates. This would not trouble me greatly but unfortunately each one has brought along a big box of specimens for determination. So I shall be extremely busy this evening and tomorrow and not able to work at your Colcoptera.

Yours ever,

E. A. SCHWARZ

2nd letter

Washington, D. C. March 5/97

Dear Hubbard,

As a postscript to my letter written this afternoon I would say that Mr. Lugger has also arrived to swell the crowd of entomologists who bring big boxes of beetles for me to determine. The prospects for my doing any work over your beetles during the next two days are very dark. Further I wish to say that your box No. 7c has safely arrived. I have just come home from the Cosmos Club where I had invited Smith & Lugger to dinner (at no other place in the city it is possible to get something to eat since we have about 150,000 strangers with us. Nor is there any place to sleep and both Smith & Lugger have just departed for Baltimore to return tomorrow evening) and opened the various pill boxes but did not dare to dig deep in the layers. I see a great many things which are quite unknown to me but only a few of those you mention in your letter. The "large

gracile Scydmaenid" is really a marvellous thing, quite new but closely allied to the European genus *Leptomastax*. Mr. H. C. Fall of Pomona who was here last summer told me he has found one specimen of a remarkable Scydmaenid in southern Cala. and from his description I have no doubt that your species is the same thing.—"Rather large blue-black Carabid, apparently a Lebiid" is a *Metabletus* quite new to me and no doubt undescribed (unless quite recently described from Baja Cala.)—"Elongate Silphid near Colon" This is apparently *Ptomaphagus californicus* Horn, described from southern Cala.; we have only one specimen given by Mr. Fall.—"Very remarkable formicophilous Staphylinid of red color"—this I have never seen before but must be *Apocellus analis* Lec. described from southern Cala.—The "*Araeoschizus* with dense spiny hairs" is the same undescribed species which you found at Tucson. It is strange that no one found this species before.—The *Ligyrys gibbosus* ? (Febr. 22) is unfortunately correctly determined; this common Scarabaeid occurs throughout the U. S.—I wonder what your red Embiid will turn out to be. No species of this family is known from the Pacific Slope, but there is probably no chance of your finding a winged specimen at this season. That the species, or at least some of them, are spinning tubes is a settled fact though it was still doubted by Hagen in his Monograph of this family.—The "Babia with red shoulders, bronze black and hoary pubescence" is a *Coscinoptera* which I do not see in our collection.—The "small slender thing... looking like an *Araeoschizus*... smooth but alutaceous... with almost invisibly fine pubescence... obovate thorax" etc is *Cononotus sericans* Lec. described from South. Cala. We have two poor specimens one of which was given us by Dr. Horn. The latter seems to have found this species abundantly (probably at Ft. Tejon, Cala) and he says: "Adheres to the underside of stones. Occurs in very dry places and is more abundant in early spring. They are generally in colonies and have their heads all in one direction. They move almost as rapidly in hot weather as *Telephanus velox*. To secure a whole colony the head one must be taken first, for if one be disturbed and runs forward among the others, all start" (Proc. Ent. Soc. Phila. 1867, p. 290).—The "perfectly colorless

Bembidium" was correctly guessed by me in my first letter of to-day as *Tetragonoderus pallidus*— Regarding the numerous small Tenebrionidae which accumulate in your collections I am in the same fix as you; I am for the present bewildered with the multitude of them and without a close study I am unable to give at present any information.—Regarding *Craniotus pubescens*, Dr. Horn says in the paper cited above "Dead specimens of this rare insect were found (probably by LeConte) at Vallecito. Living specimens occurred on the Maricopa desert, under dead stems of *Cereus giganteus*, in the months of March and November". In the same paper Dr. Horn also mentions the occurrence of *Dacoderus striaticeps* (the genus next to *Araeoschizus*) as having been found by LeConte at Ft. Yuma under Cottonwood bark. "This was evidently an accidental occurrence, as I found a pair under my medicine chest while camped at the same place" In the same paper Horn mentions also the occurrence in enormous numbers of the Meloid *Cysteodemus armatus* (with greatly inflated elytra) on the greasewood bush" of Arizona and the Colorado Desert during March and April; and finally the occurrence, in March and April on the same plant (*Larrea mexicana*) of the rare Meloid *Phodaga alticeps*, "while traveling through Arizona.

Yours ever,

E. A. SCHWARZ

P. A. I have printed any number of "Indio" labels but no insects thereto. Have you given up your plan of stopping over in the midst of the desert for a day or two?

Washington, D. C. March 21/97

Dear Hubbard,

Since quite a number of days I had been waiting anxiously for a letter from you as I did not know where to address you but finally I got yesterday your letter of the 13th and by going this morning (Sunday) to the post office I was fortunate in finding your box (lot 7 d). Both the reading of your letter and the first hasty survey of the contents of the boxes varied by a casual admiring glance at your "splendid" specimen of Dinapate furnished an excellent Sunday entertainment.

I am greatly pleased to learn that you intend to prolong your stay at Palm Springs where you seem to be well cared for and where you made a collection of far greater interest than you seem to think yourself. I only regret that for want of time I have been unable to furnish you more determinations, but as I wrote you before, by far the larger portion of the Microcoleoptera you found there belong to the most intricate genera which require close study, and there will be many new species among them. Even many of the larger forms from Palm Springs I find extremely troublesome e.g. the various species of *Blaps* and allied genera, the various *Horistonotus* etc.

The drawings for your Birch Coccid paper do not make any progress at all I regret to state. Pergande says that for want of time it is impossible for him to make sufficiently careful drawings that are fit for reproduction. Some months ago, and several times since, I have spoken to Miss Sullivan about making these drawings on Sundays or after office hours for which work I would pay her. She consented to this but she has been the entire winter over in very poor health, and in fact, has not yet commenced the drawings. If this goes on in this way the only way of publishing your paper is to make an official paper of it to be published in one of the technical Series of the Division. In this way Miss Sullivan could make the drawings during office time.

I sent another batch of your author's extras of the Ambrosia paper to Tucson; also wrote you one or two letters and forwarded several letters in one package. I think I also returned there one of your empty boxes with a few cigars therein. It seems that you have not yet received that letter but among others I requested you therein to send me 50 or 60 slips of white paper with the inscription "With the compliments of H. G. H. etc." to be pasted or laid into your author's extras of the Ambrosia paper which I could mail to your correspondents.

Ever since that Inauguration I have lost almost every evening in one way or another so that I was unable to make much headway in the determination of your collections. To make the misfortune complete I am suffering from a protracted "spring" cold with accompanying attack of rheumatism. However, every-

thing of your collection (excepting of course lot 7d) is mounted and labeled except your first specimen of Dinapate which I am afraid to handle.

From the Screw beans you sent on from Yuma another specimen of that new Bruchus has issued but also one specimen of the common Mesquite Bruchus, *B. prosopis* and a lot of parasites (3 species) From the Sunflower stems you sent from Tucson two little Curculionids have issued both being *Copturus adspersus* which is not rare wherever Sunflowers grow wild. The Cerambycid larvae in the same stems, and also those in the Cocklebur stems are still alive but do not show any inclination to pupate. From the Mesquite twigs you sent me from Tucson, a very queer Cerambycid larva has unfortunately worked itself out so that there is now very little hope of breeding the species. From the Larrea twigs sent from the same place and at the same time nothing whatever has issued so far. The Tenebrionid larvae from the rats' nests are still lively as eels and eat anything that is offered to them including cake and the locality labels placed in the boxes. Unfortunately they do not make the slightest preparation of going into pupa stage.

(I have to mail this sheet now and shall continue this letter tomorrow)

E. A. SCHWARZ

Continuation (3) Washington, D. C. March 22, 1897

Dear Hubbard,

Barring the collection you made at Yuma where under exceptionally favorable circumstances you found an extraordinary large number of species, your lot No. 7 d is one of the most interesting lots you have sent on. Small as it is it contains proportionally more interesting species and more novelties to us than any previous sending. The larger portion of the good things belong to the desert fauna which seems to develop now with the beginning of spring but I am inclined to think that in May or June also the canon fauna would produce any number of species which cannot be found now. I am pleased to learn that the phytophagous desert fauna commences to put in appearance but you must not forget that you will find the same, or a

similar, fauna upon your return to Yuma and Tucson. As to the Dinapate this is evidently a relic of ancient times and Prof Coville informs me that the same holds true with the Washingtonia palm which occupies a quite isolated position in our flora. Since you cannot possibly carry around with you the heavy pieces of palmetto wood you have saved out I would advise you to send them to me at the Department by express, unpaid, and I shall do my best to breed the beetles. I suppose there is no express office at Palm Springs; so you will have to carry the pieces at least to Yuma where you no doubt will be able to find a suitable box. Pack the pieces between some promising dead mesquite branches and they will come all right. What kind of parasite do you suppose infests the Dinapate? It must be at least an hitherto unheard of genus of Braconidae.

The following notes I have made upon a hasty survey of the various layers of your lot 7d. "Indio, March 2, under mesquite bark"—Do not swear at this locality for the only species you found there is worth several hundreds other species. It is a genus new to the U. S., allied to *Hypophloeus* of the Tenebrionidae, and I have no doubt that it belongs to the genus *Latheticus* of which a single species (*L. Oryzae* Waterhouse) has lately been found in England in rice shipped from India or China. Your species differs, however, specifically from *L. oryzae*.

"March 5. In dead palm bud, Palm Canon.—*Mycotrogus angustus* Horn (Tenebrionid) Two specimens were found by you before at Yuma under willow bark. This is a very rare thing hitherto not represented in any collection at Washington.

March 6—"Small canon. Plant 7" The bronze-green Halticid is *Hemiglyptus* (*Crepidodera*) *basalis* Crotch, peculiar to southern Cal. Its food-plant is not yet recorded by name, and Crotch, in describing the species, only says: "San Diego, devastating a blue flowering shrub in the canons round there".—*Anthicus sturmii* (or a closely allied species) which we found rather commonly on shrubbery in the canons of the Wasatch Mts. Utah.

March 6th "Valley"—I am delighted to see two additional specimens of that 2nd species of *Cerenopus* with the minute thorax and slightly tuberculated (not punctured in rows as in

C. conicolor) elytra. I am inclined to think that it is a new species though it may be known from Mexico.

March 8. "West Canon"—Here is a beautiful small *Bembidium*—bright bronze green with yellow legs; elytral punctures not in impressed rows—which I have never seen before new to our collection.

March 9—I am afraid that the *Hydraena* does not differ from the widely distributed *H. pennsylvanica* which you found commonly at the Bear Paw Mts., Mont. and in the canons of Utah, in the Yellowstone Nat. Park etc. The very small *Hydrophyllid* is *Limnebius piceus* Horn, also widely distributed in the West. It is certainly very strange that the Palm Springs locality does not seem to harbor a single good water beetle except that small *Bidessus* which, for the present, I fail to locate.

March 9. "Palm Valley, desert plants"—*Hemiglyptus basalis* (see above)—*Dasytes* sp.—elongate, unicolorous dark bronze above, pubescence very inconspicuous—a very good-looking species not in our collection—*Listrus*, with fasciate elytra, either *L. luteipes* Lec. or an allied species—*Allonyx* sp.—about the same size as the preceding, unicolorous above, with very neat yellowish-grey pubescence, thorax with an impressed line each side, not in our collection; also represented in your lot 7c.

March 11 "On *Dalea spinosa* in desert washes"—Neither the white *Apion* nor the *Tingid* I have ever seen before; both are beauties. Among the *Smicronyx* there are two species, the mottled one, which you found before at Tucson, Yuma and Palm Springs and a much rarer one with very large yellowish scales (easily abraded) also represented in your lot 7c.—The grey *Brachytarsus*, with two large, blackish elytral spots, also sent by you in lot 7c is a new species which I did not see before.

March 11 "In herbs in desert lands"—Most delicate "Reduviid" This must be something good.—"Small Collops" This is *Attalus cinctus* Lec. peculiar to the Southwest. I think that various other species of this genus will become now more or less abundant in your locality. This particu-

lar species we have from the Morrison collection but since no precise locality is attached to this nor to any other species, all species of this genus are most welcome to our collection.

March 11.—“Sandy washes, Palm Valley”—A very fine series of *Cononotus sericeus*.—*Araeoschizus sulcicollis*, the Californian species which is not among those you found at Tucson. Whether or not any species of this genus are myrmecophilous is a question not yet settled.—Very small blackish Tenebrionid with pale legs. I think this must be the true *Anepsius delicatulus* which should not be rare in southwestern Arizona.

March 11 “Desert sand under sticks, Palm Valley”—I do not wonder that this collection reminded you of the Colorado beach at San Diego, for, sure enough and to my great surprise, the whitish Otiorhynchid is indistinguishable from *Trigonoscuta pilosa*. This seems to be hardly credible for this species has always been considered as strictly maritime. However it must be remembered that not so long ago, perhaps only a million years, the Colorado desert was a part of the Gulf of California—Your second species, the *Coniontis*’ looks indeed very much like the *Coelus* which you found so plentifully at Coronado but it is a beautiful *Eusattus*, quite new to our collection. I think it is *Eu. ciliatus*, quite recently described by Horn from Baja California—The series of Edrotes is very interesting and quite puzzling; the two smallest specimens came close to *E. rotundatus* Say from Colorado and Wyoming, while the larger specimens are intermediate between *E. ventricosus* Lec and *E. ustidus* Casey. I think the whole is only one species extremely variable in size, punctuation and nature of the pubescence—The “much larger specimens of an allied genus but more elongate” resembling also an elongate *Craniotus pubescens*, is *Asida hirsuta* Lec. new to our collection, found originally by LeConte “*in arenosis desertorum Colorado*” (in sandy places of the Colorado desert)—“Pretty little stout Tenebrionid with red legs and sparse pubescence and with aricular punctures” is

Conibius puberulus Lec., originally described by LeConte from Vallecitas, Cala (due south of Palm Springs).—The Calosoma is *C. angulatum*, Chevr. new to our collection and originally described from northern Mexico.—What you call “*Asida* sp. with dentate femora” is always *Eleodes armata* Lec. peculiar to the extreme Southwest.—I forgot to say that the *Conibius puberulus* is hardly a myrmecophilous insect though the larva of this and no doubt other species of Tenebrionidae of the arid Southwest will be found to live in ants’ nests.

March 13, Palm Springs.—The small Meloid with red head is *Cantharis auriculata* described by Horn from “southern California”. We had 2 specimens in our collection from the Morrison coll. labelled “Kern Co., Cala.”

March 14. The very large Meloid with red head, thorax and legs is *Cantharis magister*, described by Horn from the desert regions of southern Cala. and Nevada.

Unless I have overlooked something upon a preliminary survey I think the above notes include everything not previously mentioned by me. Even the commonest specimens from the Palm Springs region are most welcome to our collection on account of the definite locality. I think you will find now various species of Meloidae and Malachiidae and other phytophagous families and please remember that our collection is quite deficient in well labeled specimens from that region.

I have made a few determinations of your lot 7c and previous sendings from Palm Springs which I hope I can write you tomorrow.

In our Department we are still in great expectation of what the next time will bring us. Mr. Brigham of Ohio has been nominated by the President as Assistant Secretary. He announces himself as a practical farmer and as entirely ignorant of scientific methods. Probably in consequence of this, the new Secretary announces that a “reorganization of the Department will take place shortly and that he himself will take charge of the scientific work of the Department. No one knows what this “reorganization” will amount to, so all we can do is to wait. At any rate my proposed Arizona trip has also to wait until that reorganization has taken effect.

I regret to inform you that old Dr. Hamilton died last month in Florida. Since a couple of years the old gentleman expected to die at any moment, still he lived to visit Florida 3 times and to enjoy the climate and the collecting of insects at Lake Worth.

Yours ever,

E. A. SCHWARZ

Washington, March 25, 1897

Dear Hubbard,

I was greatly pleased with your letter of the 18th you give good directions for future addresses and I shall now prepare lists and packages to be sent you at Tucson before the end of this month. Mr. Fernow told me before of the unpleasant sand- and dust storms that prevail during spring in parts of Arizona but I suppose that you will eventually change your headquarters if there is too much dust at Tucson. After all, spring is not much earlier with you than with us; last Sunday the weather suddenly became very warm, and flowers, leaves, bees and beetles made their appearance. To-day we have a reaction and it is now almost freezing but this cannot last very long, and if you choose to send on the Dinapate larvae I think they will not suffer from the cold. I examined with great interest the piece of palm wood you sent to the Department and realize now the enormous difficulty in the way of sawing or cutting out such a piece.

When you get back to Yuma and Tucson I suppose the country will look now quite differently from when you left it in January and the desert will swarm with horned frogs, Gila monsters and rattlesnakes but I have no doubt there will be also some insect life.

For some time I intended to make a list of the Coleoptera collected by LeConte at the lower Colorado and Gila, the species being scattered throughout his publications but I see that he recorded precise localities only during about 10 years after his expedition. Later on he had apparently forgotten the precise localities and no doubt many of his captures at Yuma and vicinity have been recorded as from Southern California or simply Arizona. Even in his earlier records it is often not clear whether he means with "Colorado" the Colorado Desert or the Colorado

River. Many of LeConte's captures were also subsequently described by Dr. Horn but I have not yet gone through all of his writings. But incomplete as it is I think you will be interested in glancing over the list I send you herewith in separate envelope. Do not throw it away as I contemplate to complete the same for future reference. It contains many species which you have found but you will see that a great many species, especially among the phytophagous families still remain to be found. However you may be too early for most of them since LeConte was at the Colorado as late as April, probably the end of the month.

I am commencing to capture Arizona beetles here in Washington, for day before yesterday there came flying into my office room a fine Arizona Clerid, *Clerus spinolae*. I presume it came from the samples of Arizona timber Fernow and Merriam have brought along last fall.

The Carpophilus on Cactus flowers is *C. pallipennis* which is also common in Florida. I wrote you a letter to Palm Springs in reply to your lot No. 7d and hope that it has reached you.

Yours ever,

E. A. SCHWARZ

Washington, D. C., March 29, 1897

Dear Hubbard,

I send you herewith two lists which may possibly interest you; one being the continuation of the fauna of Yuma and Tucson, the species being taken all from the writings of Dr. Horn. Some species are of course duplicated from the first list (LeConte's species) of the Yuma species. There remains still to be copied a list of the Yuma species from the writings of Capt. Casey but there are so many synonyms and doubtful species among them that a list would add very little to the actual knowledge of this fauna. The second list I inclose is an abstract of a large list of Arizona Coleoptera found by Wickham along the line of the Atlantic & Pacific R. R. at The Needles and at East Bridge (on the Arizona side of the Colorado Riv. opposite the station Needles) He was there in July and August but you will see that quite a number of the Yuma species extend northward to the Needles and if you were at Yuma in midsummer you would no doubt find

the genera *Chalcolepidius*, *Gyascutus*, *Acmæodera*, *Orsonyx*, *Mallodon*, *Aulaeoscelis*, etc. On the other hand it is safe to say that if Wickham were a little more careful collector he would have found at the Needles many of the more subtile species which you found at Yuma. Of Mr. Wickham's localities only Peach Spring is (besides the Needles) within the Lower Sonoran fauna; the remaining higher localities being either in the Upper Sonoran or even the Transition Zone so that if you should visit Flagstaff or the brink of the Great Canon you must not expect to make brilliant captures. In fact the fauna at these places would remind you considerably of that of Helena and the Bear Run Mts. of Montana.

Returning to LeConte's and Horn's visit to the desert regions of northern Arizona I find it strange that neither of them have ever published a general account of their experience. Dr. Horn is very fond of narrating his experience of the trip from San Diego to Yuma during which he could not do any collecting. During the life time of Dr. LeConte I unfortunately omitted to ask him about his trip and as I mentioned he never published a general account of it but even his biographers, Scudder and Horn, only make short allusions thereto. Mons. Aug. Sallé seems to have been the only one who has questioned LeConte regarding his experience and in his biographic note of LeConte published in the *Annales de la Soc. Ent. de France* a few lines are devoted to this subject which I herewith copy: "Dr. LeConte revint en septembre 1851 (à New York), après avoir exploré les environs de San-Francisco, San José, San Diego, Vallecitas, la Desert du Colorado, et reconnu, au milieu de grands périls, les rives du Rio-Colorado, depuis sa jonction avec le Gila jusqu'à la mer; ce fut le premier voyageur qui ait pu remonter le cours du Roi-Gila jusqu'au village des Pimas; il a en ses deux chevaux et ses bagages volés par les Indiens, ce qui l'obligea à faire 30 milles à pieds nus pour regagner le camp, se nourrissant d'épis de maïs vert. Une excursion qu'il fit, du Fort Yuma jusqu'à Tucson, lui donna un faible résultat entomologique, la saison n'étant pas favorable.—A son retour à New York, il publia les Ténébrionides et les Histerides, puis les Cicindélides et les Carabides de son voyage, dans les *Annals of the N. Y. Lyceum of Nat.*

Hist. vol. 5, 1851. Il n'avait rapporté avec lui que sa collection, laissant ses doubles à San-Francisco, pour l'en-être envoyés, mais ils furent détruits en juillet 1852, dans le second grand incendie qui brûla la moitié de cette ville."

I am greatly desirous of hearing your experience at Yuma just one month after your first visit and suppose that the progress of the season as well as the absence of another freshet will produce a great change in the character of your collection.

Your brother, Mr. C. R. Hubbard is here to induce Congress to change the proposed duty on oranges or at least to postpone the date when the new duty is to be enforced. His entire Jamaica business would be utterly ruined if the new duty is to go into effect the present summer. By a very strange coincidence Miss Mowly Morton was run over by a bicycler on 14th str. the same hour your brother arrived here. It is to be hoped that nothing serious will result although she was unconscious for several hours.

Yours ever,

E. A. SCHWARZ

Washington, D. C., April 5, 1897

Dear Mrs. Slosson

I should be very glad to name for you any Florida Coleoptera which you may choose to send to me, and of course I shall return everything. I beg you, however, to pack the specimens very carefully for the other day I was greatly shocked to see in friend Coquillett's hand a box of your Diptera which had arrived in a dreadful condition.

I have always read with the greatest interest your publications on Florida insects and especially your contributions to the Lake Worth fauna because I visited the same locality in 1887 when a large portion of the great tropical hammock was still in existence and when there was still an abundance of tropical insects to be found there.

My old list of Florida Coleoptera is of course now greatly antiquated and since several years I contemplate the publication of a new edition but since the new list embraces about 3000

species, the publication is a matter of considerable magnitude and expense. I know that your annotated copy of the list must contain many valuable additions to localities as well as to species, and I should feel under great obligations to you if you would allow me to look it over. I would also be greatly interested in seeing Mr. Liebeck's determinations of your Biscayne Bay collection.

Yours very truly,

E. A. SCHWARZ

Washington, D. C. May 4 '97

Dear Hubbard,

I cannot tell you how badly I feel that I left you so long without any news and failed to answer so many letters and packages from you, but I am in a very bad shape and have fallen in a state of nervous despondency which I cannot throw off and which has been brought about by a bad inflammation of my eyes. This prevents me entirely from doing anything at night and even during day time I can use the lens only for a few minutes at a time. Of course I should be out with you by this time but in the disorganized state of our Department no one dares to apply for leave so early in the year. The trouble with me commenced the first week in April when poor Mr. Ulke lost his oldest daughter, Anita, after a few day's illness from pneumonia. At her funeral I caught a severe cold which has itself firmly settled as a very bad cough somewhere in my throat and as a most annoying inflammation of my eyes. By an unfortunate coincidence I have lost every Sunday in April; Mr. Richardson of Fredericksburg, Va. was with me for one Sunday, Mr. Wenzel of Philadelphia for another Sunday; then came Mr. L. Bruner of Nebraska who is on his way to the Argentine Republic, and lately Mr. Perkins of England came. He has explored the Hawaiian Islands for the last 5 years and was lately with Mr. Koebele in Arizona where they regretted having missed you. They spent some days collecting at Tucson (but apparently did not find much) and at Benson in search of *Amblychila baroni* Rivers which has been found there some years ago, and finally at Nogales which is described as much dryer than the Tucson region. Mr. Ulke is very

much broken down with sorrow over the loss of his daughter and comes now almost every evening to me and I have to listen for hours and hours to him.

Just now we have been thrown into deep sorrow by another catastrophe; poor Mr. Linell was found dead in bed yesterday morning! It is an extremely sad case from whatever side it may be considered, and I wonder what we shall do with his two little daughters who are left in this world without a single relative or friend and without a cent of money. For some months Linell had kept himself pretty straight and his death was due to heart failure.

I feel so nervous about all this trouble and can hardly write this letter and the bad news about yourself in your last letter make the matter by far worse. I beseech you to think only how you can improve your health; do not exert yourself in the least and if you think that a change of locality will do you good leave at once Tucson for another place; either go back to Palm Springs or run up to Prescott or in the pine regions of the plateau of Arizona where it ought to be warm by this time.

During my long silence the material sent on by you and your unanswered letters have so accumulated that I hardly know where to begin my answer. Not less than 9 cartoons with your pill-boxes half opened are on my table and only the topmost layers have been examined by me. In order not to fall back entirely I have managed last Sunday in looking over carefully the contents of your last invoice—Tacina and Catalina Mts.—and inclose the notes.

The Scolytid from Parkinsonia wood is of course undescribed. In shape and most structural characters it came near to *Micracis rudis* Lec. but is most remarkable from its sexual characters on the elytral declivity whereas in *M. rudis* and other species of this genus the sexual characters are strongly expressed in the antennae. Mr Hopkins has no experience with *Micracis*, or else he would have founded another class of Scolytids based on biological reasons. They are "inside borers" but not Ambrosia beetles and have in my experience no definite food-plants. A few specimens have issued from the pieces of wood you sent but there issued also a most wonderful Coleopterous enemy of the *Micracis* viz. a

Trogositid allied to *Nemosoma*, a small (3 mm.) linear thing with 4 yellow spots. I find that it is a new species of *Cybidrella* Sharp, a genus quite recently described in the *Biologia Centrali-Americana* and founded upon a single specimen found by Mr. Champion in Guatemala. Two specimens have so far been secured of your species, one of them slightly injured. This is one of the most remarkable species discovered by you.

I shall continue this letter tomorrow

Yours ever

E. A. SCHWARZ

Washington, May 7; 1897

Dear Hubbard,

On Wednesday we buried poor Mr. Linell; it was of course a very sad affair but we managed at least to give him a decent funeral. Upon coming home I found on my table a note from Dr. Maurice Richardson, who had been here attending the Medical Congress. He came to my house in the expectation of finding you here and is very anxious to hear from you. I went out in the evening in the hope of finding him but failed to do so although I waited in his hotel until after 11 o'clock. Yesterday morning your invoice from Tucson arrived but I lost again the entire evening from being occupied with Mr. Chittenden in looking over Linell's affairs. We utterly failed to discover what Linell did with the larger part of his salary and it seems that everything went to the saloon keepers. Early this morning I managed to spread out a little the contents of your box and give herewith a few hasty notes regarding the contents. I may however have overlooked the best species. As a preface I would say that, excepting the *Cereus* fauna, there is a radical difference between the species you send now from Tucson and those you sent in December and January. Among the *Cereus* species I am glad to see some additional specimens of that new *Cossonus* and at least one specimen of that new *Eumierus*.

Match box Besides the *Hololepta yucateca* (*princeps*) I see two species of *Eleodes*, different from *E. armata*, the smaller one not sent before by you, but both will no doubt be described.

Pill box "Catalina Mts. Sabina Canon, April 18, *Amara californica*." The *Amara* is *Discoderus robustus* Horn (found plen-

tifully by Morrison and described from his collection). Among the aquatic Hemiptera are 2 species of Notonecta not sent before by you. The Ant-lion on top of the box is a beautiful species.

Pill Box "Sta Cruz River and adjacent pools, Tucson, April 21."—*Agabus semivittatus* Lec. (mentioned in my last letter)—*Hydroporus* sp. (many specimens). I do not see this in our collection; it is not a remarkable species but its relatives are all boreal; possibly described by Sharp in the *Biolog. Centr.-Amer.* (For lower layers see below)

Pill box "Sta Cruz Riv.; shore fauna; *Bembidium*. *Clivina* etc." I regret to say that at least the upper layer has not arrived in good condition since it was not protected by soft paper. Please discard the thin *brittle* paper and return to the well-tried old news paper rubbed soft. I must also confess that the Chinese napkin paper is in my experience not so good as old newspaper, especially if you pack several layers in one box.—The lower layers of this box "April 20th, hill side" and "April 21 from willow" have not yet been uncovered by me on account of the damaged condition of the upper layer. Among the broken specimens I see a very large, pale *Bembidium*, not yet sent before by you and which seems to be good. You may perhaps be able to replace this species.

Pill box "Riatta, April 30th few shore things and *Hydroporus*"—2 specimens of *Agabus lugens* Lec. described from San Diego and Colorado River, not sent before by you; is not rare in southern Cal. The *Hydroporus* is a species of *Deronectes* different from the *D. striatellus* which you found so commonly at Palm Springs; it does not seem to be in our collection.—The *Cryptobium* is different from the *C. pimerianum* Lec. found by you at Yuma.—The *Elmis* appears to be the *similis* sent by you before from Tucson.—A remarkable *Saprinus*, allied to *mancus*, entirely opaque almost without mirror and striae; this must be something new.—A large *Olibrus* (many specimens) which I have not seen before.

Pill box "April 29 Larger shore things." *Brachynus* sp. apparently not different from one of your Yuma species—*Anisotarsus* (*Anisodactylus*) *agilis*, widely distributed and not rare.—*Trichobaris mucorea* Lec. described from California; not a great rarity but food-plant unknown. Did you find it on a *Solanum*?

Pill box "Tucson April 28" *Discoderus robustus*—"April 29-30 Cottonwood trees," 3 specimens of *Attagenus hornii* (mentioned by me in a former letter). "April 20 from canaigre," *Gastroidea (Gastrophysa) formosa* (mentioned in last letter), *Onychobaris mystica* Casey (?) (The black, opaque weevil with red beak and legs) This is very interesting. Can you prove that its larva lives in the roots or stems of the canaigre? Is this canaigre cultivated or wild? This *Onychobaris* is not mentioned by Toumey among his canaigre insects.—"On flowering shrub, Riatta Wash. April 20"—This is a remarkable layer and contains various species not yet sent before e.g. 2 species of *Smicronyx*, 1 beautiful undescribed species of *Copturus* which has been bred at our Department from roots of cultivated *Aster* sent by Toumey from Tucson; another specimen was found by me accidentally at San Diego Tex.—"April 27 on flowers of *Riddelia*," a very remarkable *Brachytarsus*, new to our collection and probably undescribed; a *Pristoscelis* not sent by you before; the Clerid is only *Trichodes ornatus* which we found so commonly on our various western trips.

Pill box Tucson, April 25 under cottonwood bark." *Holepta populnea* (found by you at Tacna) Forficulid, quite different from that you found in *Cereus* (this is *Spongophora brunneipennis* Scudder) but identical with a species tolerably abundant in Florida.—"Sta Cruz River April 25" *Amara californica* (rather small, bronze-colored), not a great rarity; *Amara* (Leirus) very large, brown with red legs; we have this from Morrison's collection but without name.; *Blapstinus (Trichoton) sordidum*, *B. dilatatus* and another *Blapstinus*.—Lowest layer with the same inscription not yet examined since I do not like to disturb the specimens; among them I see one specimen of the very rare *Panagaeus sallei* (one specimen in our collection) (*Pill box* of April 21. Addendum) *Eumicrus punctatus* Casey, astonishing number of specimens; we have this from Morrison's collection; if there is anything else in this layer I fail to see it.—Lowest layer: Many of the Carabidae and Staphylinidae are identical with Yuma species, I see one specimen of *Lachnophorus elegantulus* (rather small Lebiid, elytra nearly white with dark median

cloud), and a large *Clambus* (minute, contractile Silphid) which must be new (Note: Change the "*Clambus* n. sp." of the yuma list to *C. seminulum* Horn described from one specimen from Ft. Grant, Ariz., new to our collection and I am not aware that it has ever been found again).

I may have possibly omitted a layer or two in the above enumeration which, moreover, is only made after a very superficial glance at the species. It is evident from this collection that at least the spring fauna has made its appearance at Tucson. Mr. Perkins informed me that he and Koebele found many Carabidae and Staphylinidae at the St. Cruz River near Tucson by pouring water over the banks but I have no doubt that they found the same things you send now. Mr. Perkins also told me that in May rain is expected at Tucson after which insects are said to swarm everywhere.

I return now to invoices made by you before:

Insects from holes of Kangaroo Rat (Dipodomys desertorum) and Sperophilus sp. Palm Springs, Cal., March 19-22, 1897.

This is the most interesting collection I have seen for a long time; To be sure there are only a few species and few specimens but in my opinion you have been well rewarded for the great trouble and expense incurred in their capture. I regret only one thing viz. that in your Gopher Insect paper you struck out the suggestion that in the subterranean burrows of other animals (besides *Gopherus polyphemus*) peculiar insects may be expected. The interest centers in the 3 species of Histeridae found by you; all three are *certainly* new, and two are *certainly* 2 new genera while the 3rd *may* also be a new genus. The species most abundantly found—with rather ill-defined red elytral spot but with distinct elytral striation—I consider for the present as a *Saprinus*, though it cannot be brought into any of the groups established by Horn or Marseul; nor is anything similar described in the Biolog. Centr.-Amer. The other two species—the one (unfortunately unique) with rather well defined red elytral spot and almost without any striation, and the other (represented by 4 specimens), entirely black with distinct elytral striation, have one character in common which removes them at once from any other

N. A. Histerid genus viz, they have only one tarsal claw but they are not identical with any uni-unguiculated genus of Histeridae known. Both species differ from each other so radically that they cannot possibly belong to the same genus, the unique specimen, especially, possesses a remarkable character viz. a deeply emarginate (in front) prosternum which I fail to find in any other described Histerid genus. These two Histerids of yours are structurally by far more interesting than your *Chelyoxenus* and you must by all means describe them in your Appendix to the Gopher insect paper.—on the *Aphodius* (one specimen, unfortunately without tarsi, evidently an old specimen just about to die) I cannot say much; it is not in our collection, nor do I see it in Mr. Ulke's collection; whether or not it is new can be found out by comparison with the species in Dr. Horn's collection. If it is new, the specimen is sufficiently preserved for description.—The *Ptomaphagus* I cannot, for the present distinguish from *Pt. californicus*, and its occurrence in holes of rats etc. is quite natural.—The Aleocharid, black, with red elytra and legs, is allied to *Alcochara* and apparently undescribed but we have it in our collection from Crotch's collection in southern California and also one specimen from Kern Co., Cal. (Morrison), so it must occur under other conditions, since neither Crotch nor Morrison dug up deep holes—A smaller, entirely black *Homalota* has been found by you also above ground at Palm Springs. (To be continued)

Yours ever,

E. A. SCHWARZ

Washington, D. C., May 18, 1897

Dear Mrs. Slosson,

Your letter of May 15th came duly to hand and the specimens arrived also safely. I am greatly obliged to you for your kind permission to retain that rare *Lema* which as you correctly say is a West Indian species. Regarding the new *Sacium* I must confess that I do not like to describe a new species from a single specimen. Several new species of this genus have lately turned up in various parts of the country and the genus should be monographed instead of rendered more difficult by the description of isolated species. I return, therefore, the specimen because I

know that it is well preserved in your collection. I made a note of it in my Florida list and whenever it is deemed advisable to describe it I shall let you know.

With the exception of the subfamily Aleocharinae, the Staphylinidae of Florida can now be determined; so do not be afraid to send them on for determination. If there are any Aleocharinae among them I shall simply return them unnamed.

I inclose a list of your species (which are herewith returned) and have also labeled the specimens in the box so that no confusion can arise.

Yours sincerely,

E. A. SCHWARZ

Washington, May 23/97

Dear Hubbard,

I was greatly relieved to receive your letters of the 12th and 13th; for although you do not write anything about your health, the mere fact that you have made a big excursion in the mountains of southeastern Arizona proves that you must feel better than when you wrote before. In one of my previous letters I intimated that from what I heard the spring at Tucson is not very pleasant on account of the dust, and if you can find in Mr. Lange a suitable man to accompany you in the mountains on a camping expedition, I feel confident it will do you good to spend some weeks in the dry mountain climate of Arizona before coming home. At any rate do not come home before the real summer has commenced in the north; even here at Washington the weather is still abominable and two or three days of very hot weather alternate with spells of disagreeable cold weather so that the Delaware peach crop has already several times been "utterly ruined" by late frosts and my cough does not improve.

Poor Mr. Ulke has somewhat calmed down but continues to come to me in the evening and reads to me the biography of his daughter. Your consolations would do him very little good; in his selfish nature he does not realize that he is not better than other people. He is now on the point of leaving for his summer home in the Blue Ridge Mts. near Pen Mar and I had to promise to visit him early next month.

Linell's affairs have been straightened up, which was not a difficult job, and a little money has been raised for his children. His landlady, Mrs. Reed, turns out to be a brave woman and will take care of the girls at present. During the last week of his life Mr. Linell commenced to draw up descriptions of new Heteromorous Coleoptera in the collection of the U. S. Nat. Museum. Since he had only a few new species I gave him for description specimens of the new Tenebrionidae found by you in Arizona and on the day before he died he drew up the description of that new *Platydema* (*P. inquilinum*) from the Neotoma nests at Tucson. The description was not quite finished and when I looked over the paper as he left it on his desk but I added the missing words, and we will publish this fragment of posthumous paper in the Proceedings of the Ent. Soc. of Wash.

Now, before falling back again in the reply to your letters I shall at once proceed to your letter of May 12th; As a preface I would say that owing to the inflammation of my eyes only a small fraction of the smaller specimens have been mounted so far but I have pinned all the larger specimens and looked over every layer in the pill boxes. The most formidable-looking layer of small things, the many Scolytids etc. of May 10th among the pines of the Chivichua Mts. I mounted yesterday (Sunday) with considerable difficulty but this layer was of greatest interest. I must further say that the hilly and mountainous parts of Cochise Co., Ariz., are of the greatest interest to the student of N. A. insects from the fact that Morrison probably collected there. All of Morrison's insects are without definite locality, in fact, it is not known whether they were collected in Arizona or Sonora. His post office address during his stay in Arizona was old Ft. Grant, but his most characteristic species, e.g., the many large and striking Lampyridae have never been found again either in Arizona or in Sonora. He remained in the field till October leaving Washington in May, and it is possible that his species are summer species which are not to be seen at any other season. Wickham was in midsummer at Tucson and in the Pinal Mts. but did not find any of Morrison's species except those of wide distribution in the southern part of Arizona.

May 11th, Sulphur Springs Valley: The Eleodes are 3 species (not yet determined) quite different from any of those you found at Tucson or Yuma; the *Eusattus* is also different but is described from Morrison's material by Champion in the Biol. Centr.-Amer. (I have the name of the species not at hand).—The "medium black and quite opaque Platynus" in the soil under leaves of *Cucurbita foetidissima* is not in our collection; if described by LeConte it must be *P. carbo*.—The "related species of bright brassy green" (one specimen) is for the present quite unknown to me and likewise not in our collection.—The "large Harpalus?" (3 specimens, all badly mutilated) is *Polpochile capitata* Lec. peculiar to Arizona and a genus new to our collection. I hope you will be able to unearth a few perfect specimens. It is readily recognizable by its large size, large head, very transverse thorax without hind angles—"Dark bronze Amara," different from *A. californica* and belonging to the *Celia* group.—"Chlaenius," only a fragment which indicates a good species.—"Black Cansonia"; this is *C. picta* Chaudoir described from Mexico, and new to the fauna of the U. S. and to our collection but I am inclined to think that it is only a race of the widely distributed *C. pennsylvanica*.—"Doryphora on *Solanum eleguifolicum* is *D. defecta* Stål which I found in southwestern Texas on the same plant; it is well distinguished from *D. 10-lineata*—"Small Agonoderus," this looks quite common and may be the widely distributed *A. pauperculus*.—"Pterostichus"; this is an *Amara* of the subgenus *Lirus*, apparently different from the species you found lately at Tucson and Tavana. "Anisodactylus"; this is a *Cratacanthus* considered by Horn as a race of our common *C. dubius*—"Aleocharid probably Myrmedonia"; these belong to the genus *Apocellus* of the subfamily *Oxytelinae* and the same, or closely allied species were found by you at Tucson and Palm Springs. All these southwestern forms were considered by LeConte as belonging to the widely distributed *Apocellus sphaericollis* Say but Casey has lately split it into 4 species, and Dr. Sharp has done the same with the Mexican forms of *A. sphaericollis*. The ♂♂ have appendages on the penultimate ventral abdominal segments and the species have been made upon the variations of this character. Otherwise they belong all to a single species.

Regarding the Oak fauna of the Mts. of Arizona (May 9) do not forget that Cockerell has described a Brachyscelid gall from this region and that Ashmead is very desirous of having the Cynipidous galls.—Your “Rhynchites with blue elytra and red thorax” is a most beautiful species of the genus *Eugnamptus* which I never saw before; it is certainly new to our fauna but may be described from Mexico.—The “elongate blue Chrysomelid like a *Chaetocnema*” is *Luperus* (now *Luperodes*) *Morrisonii* Horn, new to our collection and peculiar to Arizona. Are you sure that this has the power of leaping? It belongs to the Galerucinae and not to the Halticinae.—The “*Omalium* from the regions of the pines” (Pine Canon, May 9th) is most closely allied to the species you found in *Cereus giganteus* at Tucson but certainly specifically distinct.—The insects you found at this altitude and still higher up (May 10th) are of intense interest. They represent partly species widely distributed throughout the boreal region, partly species which are only known from the boreal regions of the Rocky Mts. or from the boreal regions of the Sierra Nevada, or species peculiar to the boreal regions of the mountains of the extreme southwest. The last are of course the most interesting species and I am delighted to see among your material many of them; although for the present I can name only a few of them. “Very large red *Cryptobium*” appears to be *C. arizonense* Horn; the *Philonth* not yet investigated; *Stenus*, 2 or 3 species, not remarkable, quite different from those from Yuma and Tucson. “Black rather opaque *Platynus*” is *Calathus dubius* which occurs also in the mountains of Colorado, etc. The *Gyrinus* is the Californian *G. plicifer*. The “very large black and very polished *Laccophilus* is *Rhantus atricolor*, known only from Mexico and Arizona (we have 2 specimens collected by Morrison). The small shining *Hydroporus* is *H. vilis* which is not rare in the Rocky Mt. region; the larger, more opaque species is *Deronectes striatellus* found by you so commonly at Palm Springs. The *Hydrophilid* “like *Cereyon*” is *Hydrobius* (*Creniphilus*) *infuscatus* Mots. which occurs throughout the boreal regions of the West. The *Hydraena* is again the widely distributed *H. pennsylvanica*. Among the numerous species from May 9th not referred to in your letter I will

mention a very large and black *Lithocharis*, 3 species, which I never saw before, and a very fine, rather small *Podabrus*, black with red head and thorax, which is new to our collection and apparently undescribed. Here comes also again *Platynus bicolor* which you found so commonly at Palm Springs.

May 10th. This was a grand collecting day for you; the number and quality of the species being extraordinary but an enumeration not yet possible. Those mentioned in your letter are as follows: "Very large *Anthophagus* with read elytra the tips of which are fuscous." This is *Deleaster concolor* Lec. of the subfamily Oxytelinae (allied to *Trogophloeus*) a rare species known from Colorado and Utah but we never found it before.—"dark-brown almost black *Lesteva*." This is an *Orobanus*, probably undescribed. The occurrence of this genus (which we found so plentifully on our western trips) in the mountains of southern Arizona is very interesting.—The *Philonthi*, *Tachinus* and other *Staphylindae* have not yet been investigated they have as you state a decided northern adspect.—The enormous lot from freshly cut pines contains numerous rarities and novelties: "large *Dendroctonus*." This I cannot find but is no doubt the widely distributed *D. terebrans*.—"Three different clerids (*Thanasimus*)," I find 4 species which increase in quality with the decrease in size. The "largest half an inch long is *Clerus sphegeus*; the next in size, *Clerus nigriventris*, both are not rare in the mountainous regions of the West; the third species (not referred to in your letter) is smaller, more depressed than *nigriventris* with less conspicuous and differently arranged whitish fasciae; I have for the present no name for it, the 4th species "quite inert very depressed and nearly black with fine white specks" is something brand new. I think it belongs to the genus *Trogodendron* but nothing like it has been described from the U. S. or Mexico. There are fortunately 4 specimens of this beautiful thing. The large reddish *Anthonomus* with two humps "looks indeed very much like the apple *Cureulio* (*A. 4-gibbus*) but is specifically distinct and probably new unless it be a giant specimen of the western *A. (Tachypterus) consors* Dietz.—There is also a smaller reddish *Anthonomus* (not referred to in your letter) which looks very good. Of *Ptinidae* I see two species of

Ernobius both new to our collection, one very large, the other extremely small and looking like a Hemiptychus.—The “large and handsome Graphisurus” is *Acanthocinus obliquus* which you found at Assiniboine and Lake Tahoe but the Arizona specimen is much larger.—“Small elegant Cerambycid, hairy and with red thorax (Batyle?),” this is great rarity, it is *Phymatodes maculicollis* Lec. the type of which was found by us on Isle Royale, L. S. Only a few specimens have since been found in Colorado.—Of Scolytids I find 5 species (not counting in the Dendroctonus) two of which are new to our collection and probably undescribed: *Tomicus confusus* (or allied species), 2 specimens. Other species of this genus are sure to be common in your mountains but probably all are described. *Pityophthorus nitidulus* (this is your “Guathotrichus the ♂ having a long brush of yellow hair on the head), more than 130 specimens; this occurs all over the West wherever pines grow but not in the Lake Superior region.—*Pityophthorus* sp., very few specimens, smaller than the preceding, elytra feebly punctate in striae, the ♂ without long yellow brush on the head. This was found abundantly by Koebele in the mountains adjacent to the Death Valley; it may be among the species described by LeConte.—*Pityophthorus* n. sp. only a few specimens; nearly twice as large as *P. nitidulus*, much smoother at the elytral declivity, the ♂ with a short brush of yellowish-gray pubescence on the head. This is a very fine species.—*Dryocoetes* (?) n. sp., only 2 specimens, as large as the preceding, elytra rather coarsely *irregularly* punctate and with *erect* sparse pubescence. This is a beautiful species of which I hope you will get more specimens if you come again among the pine trees.—Of species not referred to in your letter I mention two species of *Lasconotus* (Colydiidae, enemies of Scolytids) both represented by uniques and perhaps both new to us. They look very much like a narrow *Ditoma* with a peculiar thoracic impression.—I forgot to mention the Pselaphid among ants (Cremastogaster). This is *Fustiger californicus* Brend.(?) of which we have one specimen from Williams, Ariz., collected by Wickham.—The Bembidium represent 4 species, the largest being *B. mexicanum*, the smallest (a uniformly bronzed species) being represented by a single specimen.—The *Cryptohypnus* is

unfortunately *C. pectoralis* (pale form) which we found so abundantly in the canons of Utah.

I shall continue this letter tomorrow

Yours ever,

E. A. SCHWARZ

Washington, D. C. June 1/97

Dear Hubbard,

In spite of all exertions I am falling back more and more in the working up of your material and in the reply to your letters. Yesterday being a holiday and the preceding Sunday I worked hard but succeeded only in mounting all of your Chiricahua Mts. material and some of your last sendings from Tucson. In the meantime your letters of May 18th and May 19th arrived and this morning your great letter of the 25th (with appendix dated May 27th) and two big boxes came. In the office I opened your box addressed to Dr. Howard (who is at present gone to Massachusetts looking after the Gypsy Moth or rather after the Gypsy Moth Committee who managed to introduce accidentally another European Bombycid moth, *Porthesia chrysorrhoea* which is much more dangerous than the Gypsy Moth) and Pergande studied the Lecanium and myself the Coccinellid. The Lecanium is *Toumeyella mirabilis* described by Cockerell from Tucson on Mesquite. Pergande says, the genus is a good one although it has not been properly described by Cockerell. The Coccinellid I had never seen before but I determined it with certainty as *Thalassa montezumae* Mulsant. I was extremely glad to see a representative of this genus which is very closely allied to *Brachyacantha* and *Hyperaspis*. The species is described from Mexico and is recorded in the Biolog. Centrali-Americ. from many localities as far south as Guatemala but Mr. Gorham states that it seems to be rare everywhere. It has never been found in Arizona and the only specimens known from our fauna come from San Jose del Cabo in Baja California. It constitutes a new genus for our collection. Its wide distribution does not indicate unity in food-habits; still it is possible that it is confined to Lecanium and that its introduction into California would add an important enemy to the Black Scale. Such importation appears to me quite feasible but there

is at present no one in southern California to whom the management of the Coccinellid could be entrusted. The larvae, pupae and imagoes of the *Thalassa* you send are thickly covered with Lecanian larvae and there is imminent danger that the intended introduction of the *Thalassa* would result in the introduction of the *Toumeyella*. Koebele is now in Mexico collecting Scale-feeding Coccinellidae for transportation to Honolulu and is not expected to return to Alameda before the fall. You may send the *Thalassa* to Cockerell but he is quite ignorant with the methods of colonizing an insect and may possibly allow the Scale to run away at his place. The larva of the *Thalassa* very closely resembles that of *Brachyacantha ursina* which are kept as cattle by the ants. Several predaceous Lepidopterous larvae were among the *Toumeyella* sent to the Department.

Before answering your letter I must record some breedings of larvae sent by you: From the Sunflower and Cockerbur stems sent by you from Tucson last December the Cerambycidous borer has finally been bred. It is unfortunately the common *Ataxia crypta* which lives in old cotton stalks and all sorts of drying up branches all over the South. I think I wrote you before that from the same sunflower stems the little *Copturus adspersus* has issued.—The Tenebrionid from nests of *Neotoma albigula* has finally been bred—*Nycobates subnitens*, as predicted. You never found the imago alive and only sent a dead specimen (but in good condition) found among the debris of the nests. The larvae refused to eat here anything but paper but devoured one label after another and were exceedingly fond of blotting paper slightly moistened with water.—The Cossus larva you sent from Palm Springs to the Department has also been bred after having done a great deal of damage by boring through several thick boxes. You sent it in a box containing some moths and other material, all of which this savage larva had devoured. The imago no one knows but it is identical with the imagos you sent on lately from Tucson and which you found flying at night.—The Pyralid from the spines of *Koeberlinia* from Tucson has also been bred but nobody here can name it.—To-day while looking at the pieces of *Parkinsonia* wood bored by the new *Micracis* I beat out a beautiful small Clerid beetle, entirely unknown to me and quite new to our collection.

Since many days nothing has come out from this wood and I shall now proceed and cut the pieces up in the hope of finding more specimens of this Clerid and of that Cyliidrella (Trogositid).—From the mesquite twigs you sent from Tucson last December nothing has so far been bred but I know now that they contain 2 Cerambycid larvae which once a while make their appearance having eaten their way entirely through the twig. I always put them in again at the other end of the twig but it is extremely doubtful whether the imago can be bred.—The Larrea twigs sent from the same locality and same date remained silent until quite lately when something commenced to throw out heaps of sawdust; it is apparently also a Cerambycid and there is some chance of breeding the imago.—The Bostrychid from the stems of *Allenrolfia* from Salton has not yet been bred but there is evidence that the larvae are still alive. I am afraid the imago will turn out one of the common *Synoxylon* peculiar to the southwest and which you would find commonly as imagos later in the season.

While speaking of bred specimens I cannot refrain from mentioning here two other species. First your Lampyrid from *Cereus giganteus*, bred May 7th. I had noticed the larva sent by you with the *Cereus* material but it did not appear to be something extraordinary. The imago bred by you is however a beauty, a *Lygistopterus* which I never saw before and which is no doubt undescribed. It is not described from Mexico. Your second discovery in *Cereus*, viz. the presence of the broken Colydiids in the *Cactophagus* cells is most extraordinary and I fail to find an explanation of this phenomenon. I opened one of the cells you sent and sure enough there were the battered Colydiids in great number. The strangest thing in this connection is that you never found this Colydiid elsewhere. It is a *Bothrideres* and a new species. Not a single specimen is entire but the species can be described from the fragments. If you come across the old cells of *Scyphophorus* in *Yucca* or *Dasyllirion* do not fail to investigate them for this Colydiid. Our eastern *Bothrideres geminatus* is quite abundant under bark of various trees and its larva is probably predaceous.

I have opened the boxes of your Galiuro Mts. collection but only took a glimpse at the topmost layers so that I have not yet

seen most of the species mentioned in your letter. However I saw enough to satisfy myself that your Dasytirion fauna is of the greatest interest and contains *many* astonishing species. First of all it is very interesting that you found in the Dasytirion a large proportion of the Cereus fauna; the Hololepta is however different; it is *H. vicina* Lec. described from San Diego, Cala.; habits never recorded. The Trogosita-like beetle is for the present entirely unknown to me, even as to its family relation!! It is certainly a most interesting addition to our fauna whatever genus it may turn out to be. I have to mount a specimen before I can investigate it.—“The commonest Staphylinid apparently allied to Siagonium” is a veritable beauty indeed. It belongs to the genus *Piestus* which abounds in species in central and South America and the particular species of *P. extimus*. Sharp described in the Biolog. Centr.-Amer. from Chihuahua. In 1895 Dr. Horn (in his 1st addition to the Coleopt. Fauna of Baja California) called attention to the existence of this species in Arizona, having received one specimen from Mr. Ricksecker. No precise locality was hitherto known.—The *Eleusis fasciata* I have not yet seen but I find it remarkable that this true bark-beetle should occur in Dasytirion.—“Small Staphylinid related to Stiliculus”; This is also a beauty which I never saw before; it is an Echiaster (= *Lena* Casey) of which another, entirely pale species is not rare with us under old leaves. Your species is no doubt undescribed. The “Tenebrionids, small quadrate forms” and the *Araeoschizus* (2 species)” I have not yet seen but your “1 ex. of an interesting Ptinid, hairy and red in color, apparently related to Hemipytchus” is another first class rarity. It is pretty certainly *Rhadalus testaceus* of the Melyridae (*Malachiidae*); peculiar to Arizona, a genus new to our collection; nothing recorded of its habits.—The *Apotrepus* does not seem to differ from *A. densicollis* you found so plentifully in Cereus.—The yellow Luperus on Nolina is apparently *Triarius trivittatus* Horn (the genus has quite recently been erected by Horn, allied to Luperus) described from the Pinal Mts., Ariz.—“Lamellicorus larvae in central axis of dead Dasytirion.” Whatever this may turn out to be I do not know yet but at least some of the larvae you sent from the Sta. Rita Mts. are still alive, and Pergande feels sure of being able to

breed the imago. In fact, one larva seems to have changed to pupa. Pergande had great trouble in providing food for these larvae but finally he found that they accepted the old Yucca flower stems which grow in the Department grounds. Of two larvae put in the same stem one was killed by the other which bored its way straight through the body of its companion.—The Cerambycid of the size of *Oeme rigida*, light yellow, smooth and with faint lines on elytra'' is no doubt *Gaminus vittatus* (although I have not yet seen the specimen), peculiar to Arizona; habits unknown, we have a specimen from Morrison's collection.—The large Psyllid from Celtis is a species of *Pachypsylla* which I know from specimens collected by Morrison. The galls you send are closely allied to our eastern *P. venusta*; the imagos are a little different but probably only races of the same species.—The "riparian fauna" has not yet been investigated by me and I cannot tell, therefore, if it contains something peculiar. The large rather pale Bembidium is the same you found at Tucson.—The Cicindela is not one of the common forms; it is *C. tenuisignata* Lee, peculiar to the southwest; I found it also at Laredo, Tex., along the Rio Grande.—"Large pubescent etc. Dorytomus" is *D. brevisetosus* Casey, described from Arizona; that this species develops in the Polyporus fungus is very interesting, because the allied species have been bred from the calkins of Cottonwood. (It may have only harbored in the old fungus, which was in a hollow cottonwood.)—"4 or 5 specimens of very strange little Carabid, pale yellow, size of an Agonoderus etc."; I have not yet uncovered this layer but the species is unquestionable the rare *Pachyteles testaceus*, described by Dr. Horn from specimens found at Fort Grant; it is a genus new to our collection.

The rest of your collection is for the present still invisible to me but tomorrow I shall go to work and soften the upper layers so that I can at least see what is in the lower layers. The mounting of all this immense material will take considerable time since with my inflamed eyes I make but poor progress. I have, however, mounted your entire Chiricahua Mts. collection and also the layer of Staphylinidae marked Pine Cañon, May 10th. This contains an astonishing number of species, only one of which, *Actobius* (*Philonthus*) *paederinus* (red and blue) is identical with the fauna of Yuma and Tucson. Some of these species will be boreal

species of more general distribution but I see at least several species which are no doubt peculiar to these southern mountains. The most remarkable among them is a rather small brownish, opaque *Aloscharid* (?) with very long, fine and setose antennae and with the sides of the thorax explanate. There are 2 specimens of this rarity, the like of which I have never seen. The large black *Philonthus*, a very common looking species, seems to be also something good, for I failed to see it in our collection. If you visit this cañon again do not fail to try again sifting near the water.

The news about your health could be better and I am especially sorry to learn that you took again that beastly medicine, calomel from which you had to suffer always. Do not work too hard and above all do not go north too early. Just now it is snowing in the north and it is very cold and chilly here.

I enclose a full abstract, almost a copy, of Wickham's little paper on his excursion through the Pinal Mts. which may possibly interest you. You will see that he either found very few species or failed to mention his best captures.

When J. B. Smith was here he told me that he made a photograph of the *Washingtonias* at Palm Springs. As I never saw a picture of this palm tree I asked Smith to give me this photo which he did and I enclose it herewith. You will see therefrom that Smith—and no doubt many other travellers—mistake the *Yuccas* at the depot of Palm Springs for the palms!

I wrote you a letter to Willecox, and I am quite astonished to see that you did not receive it when you mailed your last letter. I also sent two boxes of vials, and a box of cigars and forwarded several letters. I also mail with this a package with empty slide boxes.

Take care of yourself.

Yours ever

E. A. SCHWARZ

Washington, D. C.

June 3, 1897

Dear Hubbard,

In my account of specimens bred from material sent by you I forgot to mention that from the *Alleurolfia* stems from Salton

quite a large Dipterous larva (a Tachinid??) made its way out of the stems. We put it in a jar containing pure salt in which the larva at once buried itself and where it seems to feel at home. It is still alive and has shed one skin. From your various sendings of Srew beans nothing new has issued, the set from Yuma furnishing *Bruchus prosopis* and that new *Bruchus*, that from Palm Springs *Bruchus prosopis* and *B. desertorum*. The numerous hymenopt. parasites are the same in all sets.

Yesterday evening I commenced to mount the Dasyliirion material and although I did not come very far it is plain that this fauna is quite different from that of *Cereus giganteus* and is somewhat related to the fauna of the Cottonwood bark, omitting of course the species peculiar to Dasyliirion. The *Belonuchus* is quite different from *B. ephippiatus* and may be the true *B. xanthomelas*. Of the *Paromalus*, the one with nearly complete elytral striation is *Epierus planulus* Er. (described from Mexico) which you found under cottonwood bark at El Rio and Taena (it was found by LeConte at Yuma); the other species without elytral striae is *Paromalus tenellus* found by you with the preceding. It is new to our collection and was found by LeConte under bark on the Colorado. The medium-sized Aleocharid with bright red elytra is to my surprise identical with the species you found in rats' nests at Palm Springs about which I wrote you before. I remember now that it is the species to which Crotch gave the MS. name *Homalota cacti* (found by him in southern Cal.—A very small black *Homalota*, not at all remarkable but not found by you before.—The *Eumierus* may be identical with the *Cereus* species, and so are the *Ulosonia marginata* and the little *Ditoma* (this seems to be undescribed) but the three last named species are not peculiar to *Cereus* and were found by you plentifully under Cottonwood bark. About the Hololepta I wrote you before. The *Hyporhagus* may be *H. opuntiae* though with your large series sent on before I got a little mixed up in regard the specific limits of these species.—What the other Dasyliirion species in your boxes will turn out to be I do not know yet.—I have mounted and investigated several specimens of that brown Trogosita-like species and find that it belongs to the Heteromera. In fact it is an *Othnius* and quite different

from any hitherto described from the U. S. or Mexico. The species of this genus are still extremely rare in collections and nothing is known of their food habits or earlier stages. You will remember that you found 2 specimens of *Othnius umbrosus* at Hood River, Or., on the pile of oak wood near the hotel.—The Rhadalus was correctly recognized by me; it is also an extremely rare insect and nothing is known of its habits.

I am in trouble about printing locality labels for your specimens found since leaving Tucson. My little map of Arizona is too imperfect to follow your expedition and while for the specimens of May 9th and 10th the label "Chiric Mts" will probably suffice I do not know how to label the specimens from May 11th (Sulphur Spring Valley) nor those of your last expedition to the base of the Galiuro Mts. Please prepare me for printing the localities; also tell me whether I have to print "Sabina Cañon." The fauna of that locality seems to differ considerably from that of Tucson.

Two specimens of a little Hemiptychus, not a remarkable species, issued to-day from the old Psyllid galls on Celtis which you sent on.

Regarding the *Thalassa montezumae* I will add that Crotch records a specimen said to come from New Orleans; the locality is no doubt incorrect or the specimen was accidentally introduced from Mexico. The pupa of this Coccinellid is very remarkable and closely imitates the Lecanium (Toumeyella) scale.

Yours ever

E. A. SCHWARZ

Washington, D. C.

June 4, 1897

Dear Hubbard,

I forward herewith a letter just received and add a few words on the progress of the mounting of the Dasyliiron insects. I finished yesterday evening the small pill box of May 24th. The Trinium (one specimen) is *T. puncticolle* which you found also in Cereus; the Holoparamecus does not differ from those in Cereus and those from Palm Springs. Besides the very small Homalota mentioned in my last letter, there were 3 other Aleo-

charids: 2 Homalotas, not remarkable, one being closely allied to but specifically different from the *Cereus* species; the other, very common looking has been found by you at Palm Springs. The 4th very minute Aleocharid is an *Oligota* (one specimen) not found by you before. At the bottom of the box were the few species that came to light on the same day. Among them is a rather inconspicuous but most remarkable species (one specimen) which I take to be a Lampyrid allied to *Phengodes*. It is about 7 mm. long, narrow, dirty testaceous, with very short, pointed elytra, the hind wings not folded and covering the long abdomen. There is nothing similar described from our fauna but some apparently allied genera are described by Gorham from Mexico who places them in the *Lymexylidae*. If your species is allied to *Phengodes* it has probably a luminous larviform female. The other species of the same layer are: *Gaminus vittatus* (cerambycid), quite rare in collection, known only from Mexico and Arizona, only one specimen (coll. Morrison) in our collection; *Notoxus calcaratus*, found by you commonly at Tucson, Yuma, Palm Springs, etc.; *Monoxia guttulata* (Chrysomelid) found by you at Yuma and Palm Springs; *Bembidium flavopictum*, extremely abundant at Tucson, Yuma, etc; *Bradycellus rupestris* found by you at Tucson, Palm Springs, etc.

Another wonderful thing (not referred to in your letter) has been found by you at Tucson, May 6, "came to light in bedroom." There are only two specimens in this layer, one the Dermestid *Attagenus hornii* which does not seem to be rare in Arizona. This is no doubt the parent of the blackish larva with long black anal pencil of hairs, the skin of which has been sent on by you at several occasions and also among the *Cereus* material. The second specimen is the remarkable one: it is slightly shorter than the *Attagenus*, oval in outline, brown, pubescent, antennae and legs about as in *Epuraea*, the thorax with 8 longitudinal costae, elytra strongly punctate-striate with the interstices subcostulate. I have never seen anything like it, and at present I take it to be a new genus of *Colydiidae* allied to *Synchita*.

Yours ever,

E. A. SCHWARZ.

Washington, D. C. June 7, 1897

Dear Hubbard,

I forward herewith another letter and add a few more notes on the mounting of your last invoice. Yesterday being Sunday I did a great deal of mounting but struck some layers containing many small things so that progress was very slow.

The "Pill box of May 20th," Foothills of Winchester Mt." contains some wonderful things. There is first that beautiful Carabid, *Pachyteles testaceus*, an extremely rare thing and a genus new to our collection. It was described by Dr. Horn from a few specimens he found in company of *Panagaeus sallei* at Ft. Grant. A second, much larger species of *Pachyteles*, *P. parca* has been described by LeConte from an unknown locality in Arizona.—In the same box I found to my delight a second, much brighter colored specimen of the Lampyrid allied to *Phengodes* which I mentioned in my last letter. I looked somewhat close at the specimen and for the first time I saw the marvellous formation of the palpi; both the labial and maxillary palpi have the last joint enormously prolonged so that they appear as black threads lying upon the breast. From this structure I recognized the insect at once as belonging to Horn's genus *Telegeusis* described by him last year from a single specimen from the Sierra San Lazaro in the Cape Region of Baja California. Horn places this genus in the tribe Drilini of the Lampyridae which tribe is known only in a few genera from Europe in which the ♀ is almost as larviform as in *Phengodini*. The ♀ of *Drilus* has been found only feeding on snails. Your species is no doubt identical with that described by Dr. Horn.—In the small box there were also two specimens of a true *Phengodid*, viz. *Mastinocerus opaculus* Horn, described with the preceding species from one specimen from Arizona (precise locality unknown). It is about the size and nearly the color as the *Telegeusis* but at once known by its flabellate antennae. It is new to our collection though we have plenty of specimens of *Mastinocerus texanus* which may also occur in Arizona since Horn has it from Baja Cala. The female of *Mastinocerus* is still unknown but is doubtless larviform and brightly luminous. You may possibly find it at night in your camps.—There is further in the same box one

specimen of a Silphid genus new to our collection viz. *Echino-coleus setiger* Horn described from two specimens from Arizona (no precise locality known). It is a broadly oval, small, brownish *Catopid* closely resembling in outline our *Ptomaphagus* (*Catopomorphus*) *brachyderus* which was one of the greatest rareties we found in Michigan. I had never seen the *Echino-coleus* before and am not aware that other specimens exist in collections besides the two type specimens. The same box contained further a very nice little *Lathrobium* (1 specimen) not sent by you before, a good-looking *Melanotus* (two specimens); an *Apocallus* (the *Myrmedonia*-like reddish *Staphylinid*) different from the species from the Chiricahua Mts. Your *Cossonus* from willow is a *Rhyncolus* differing from any in our collection. The *Psylla* from *Celtis* is a *Pachypsylla* but probably not the author of the galls you sent.—The *Capsid* from *Yucca* leaves is known to me from Texas. It has a name, and Townsend has published a note on it from New Mexico.—The *Capsid* from *Agave Palmeri* is unknown to me.—Among the *Dasytirion* material, box May 23, I was pleased to find many duplicate specimens of the small species mentioned by me. Among the *Histerid* there is a third species viz. *Epierus nasutus*, described from Arizona. It is most closely allied to *E. planulus* but has a little horn on the clypeus and a little different elytral striation.—A *Hesperobaenus* or *Nomophloeus*), 2 specimens, entirely red, not found by you before and probably undescribed.—A beautiful *Lithocharis* (1 specimen) large, deep black, which I never saw before; it is allied to the species you found May 10th on the Chiricahua Mts.—A small, insignificant-looking *Leptacinus* (allied to *Xantholinus*), two specimens, may turn out to be a new species. The square-bodied, medium-sized *Tenebrionid*, black, with red legs and antennae, opaque, elytra without striae is a very good-looking *Conibius*, not in our collection and not described in Horn's Synopsis; it may however have been described by Casey.—The *Cremastochilus* in the same box is *C. saucius* Lee., described from Arizona (Ft. Whipple), only one specimen in our collection (Morrison). I suppose there is no connection between this species and the *Dasytirion*.—Among your large weevils from *Dasytirion* there are only two specimens

of Yuccaborus, the next being Scyphophorus. Should you find old pupa cells of the latter try and find in them that new Bothriдерes (Colydiid) which you found at Tucson in Cactophagus cells.

Yours ever,

E. A. SCHWARZ

Tucson, Ar.,

June 25, '98.

Dr. L. O. Howard,

U. S. Entomologist.

Dear Sir,

I managed to-day to prepare for shipment three cigar boxes filled with pinned insects, mostly lepidoptera collected partly at Catalina Springs (foothills of Sta. Catalina Mts.) and partly in Madera cañon, St. Rita Mts. of this Territory. Regarding the specimens I hope that at least a portion of them will be new or acceptable to the U. S. Nat. Mus. collection. The system of labeling has been explained in one of my last letters but regarding the packing material I must add a few words. Having forgotten to take sheet cork with me I borrowed from Prof. Toumey one dozen sheets of cork (2nd quality) which I beg you to return to him as soon as convenient since he intends to leave for California within the next two weeks. Further, I used, with great success, my old San Antonio overcoat for packing the boxes, and I would beg you not to have the coat sent over to my house. The entire package goes from here by express, *unpaid*. I hope the specimens will arrive in good condition; a portion of those captured by me at Madera cañon are still here but I will ship them from the Oracle where we go next Monday.

I also shall mail you to-day (if possible, or at any rate tomorrow a small package, (marked no. 12) containing two pieces of a mesquite branch covered with a scale which neither Mr. Hubbard nor myself saw before. They occurred on a clump of trees in the large mesquite forest which in former years covered the entire Sta Cruz valley south of Tucson but of which only fragments have escaped the general destruction by man. All trees affected by the scale were dead or dying and the scales

themselves seem to be all dead. The particular locality is about 10 miles south of Tucson.

Respectfully,

E. A. SCHWARZ

Crescent City, Fla.

Dec. 19/98

Dear Dr. Howard,

I arrived here yesterday and expect to leave again tomorrow for Washington. Henry Hubbard is still alive but in the most pitiable condition. The end may come at any hour or it may be deferred for a couple of weeks. He suffers fearfully but bears up manfully. He was greatly pleased to see me once more.

Mr. C. B. Hubbard and two of his sisters as well as Mrs. H. G. Hubbard and her mother are here so there is plenty of attendance.

Yours sincerely,

E. A. SCHWARZ

Detroit, Mich.

January 21, 1899

Dear Dr. Howard,

When Hubbard died at Crescent City there were only his wife and her mother present and as there were thousands of things to be attended to I could make myself quite useful. We left with the body on the same day northward, had in Jacksonville quite a time with the State health authorities and in Cincinnati another day regarding the transfer of the body. But we managed to reach Detroit early this morning. The funeral will take place tomorrow afternoon and you may expect to see me return on Tuesday morning.

There was universal mourning at Crescent City, and many hundreds of white and black people lined the road through the pinewoods when we carried Hubbard's body to the railroad station. I am quite tired out.

Yours ever,

E. A. SCHWARZ

Washington, D. C., Febr. 20/99

My dear Mr. Fall,

It is true that I have badly treated you of late years and I hardly know how you can pardon me for this neglect. The fact is that during the past two years I have been and am still badly sick, and further all my thoughts were concentrated in the welfare of my old friend Mr. H. G. Hubbard who since the fall of 1896 has been suffering from tuberculosis. In spite of all care and attention given to him he has succumbed last month to this terrible disease, and his loss bears heavily upon me. With the death of LeConte, Horn, Hamilton, Linell and Hubbard I feel very lonesome and shall hardly be able to pick up my old enthusiasm for Coleopterology.

Dr. L. O. Howard has just shown me your letter of Feb. 2nd in which you ask for the loan of the Nat. Museum material in Lathridiidae. I am extremely glad that you intend to work up this family and Dr. Howard will no doubt let you have all we possess. The old Museum collection contains hardly anything of interest in this family excepting the material collected by Koebele in the Pacific States. The collection Hubbard & Schwarz belongs now to the Museum but is not to be incorporated as long as I live. It is probably richer in N. A. Lathridiids than any other collection and the specimens are certainly more carefully labelled than elsewhere. But now comes the trouble! The pinning and packing of all these subtle things involves an enormous outlay of time and work, and this is the only thing which I hate to do in this matter. However I am gladly willing to undertake the job; please let me know at what time you want the material. The Lathridiidae of the Hubbard & Schwarz collection fill 3 Smith boxes.

Can you furnish me, as a loan or in exchange, a specimen of the Scolytid *Chaetaphloeus hystrix*? Hubbard & myself we have turned up, mostly in Arizona, 8 or 9 species of this genus but none seems to agree with LeConte's description of *C. hystrix*.

What has become of your Monograph of Apion? In 1897 and 1898 Hubbard & Schwarz made a good collection of Apion in

Arizona and have most of our species connected with their food plants. Do you want to see them?

Yours sincerely,

E. A. SCHWARZ

Washington, D. C. Feb. 27/99

My dear Mr. Fall,

Mr. Ashmead has commenced the pinning and packing of the Lathridiids of the old Museum collection. Those of the Hubbard & Schwarz collection I intend to pin and pack myself but I regret to state that my right arm is still paralyzed and that for the present I am unable to handle the pinning forceps.

At the Department of Agriculture there are some European Lathridiidae determined by Mr. E. Reitter; do you desire to see them? Do you include *Monoedus* in the Lathridiidae? I see that Dr. Sharp has made a new family of this genus placed near Colydiidae, and he may be correct. In some of the genera it is essential to consult the foreign literature, *e.g.*, in Cartodere where we have quite a number of species but probably not one of them is a native of North America. Have you access to Mr. Belon's writings on Lathridiidae? Have you Motschulsky's paper? I presume the latter's descriptions will cause some trouble in the absence of typical specimens but I believe to recognize a few of his species.

I am afraid that among the Coleoptera I collected last year in Arizona there is still another undescribed species of Acmæodera. I have only quite recently found time to determine this set of Arizona material and could not send this species sooner, but I will submit it to you with the Lathridiids.

Yours sincerely,

E. A. SCHWARZ

Washington, D. C. April 7/99

Dear Mr. Fall,

Many thanks for your determination of the Arizona Apion. For the present I am unfortunately unable to appreciate the value of your remarks, because I have not yet commenced to study your paper in connection with the specimens. To tell the

truth I still feel the effect of friend Smith's Synopsis of Apion and recollect only too well the many hours of fruitless work I spent over this work. Our knowledge of the life habits of the N. A. Apion is ridiculously small, but when we shall have a better knowledge we will be able to distinguish between "species" and "varieties."

Some years ago I found at Washington a Holoparamesus which from Chevrolat's figures (in Ann. Soc. Ent. France, 1843) I determined as *H. villae* (= *singularis*) but the only specimen got lost through the carelessness of Mr. Chittenden. I see, however, from Mr. Ulke's list of the Coleopt. of the District of Columbia that he has this species. Ulke has retired from entomology but I shall make an effort to secure a specimen from his collection. His collection is for sale and if you have \$5000.00 to spare you can have it. To me it is only worth about \$500.00 on account of the types it contains; for the rest of his specimens I would not give anything for they are not properly labeled.

Last week I had one of our boys mount a box of my duplicates from Arizona containing the Apion (*A. pyriforme*) peculiar to *Mimosa biuncinata*. There were about 200 specimens in the box but only three of them are *entirely* black. This is my no. 3004 which has been determined by you as a possible new species. It seems that this species only rarely acquires its full coloration, but the reddish color of the elytra is certainly only a sign of immaturity.

Upon my return from Office I find to-day your letter of April 2nd. The specimens you send with it have not yet received but I shall probably find them tomorrow at the Department.

Yours sincerely

E. A. SCHWARZ

Washington, D. C. April 10, 1899

Dear Mr. Fall,

The box came safely to hand and the contents proved to be of great interest, since most of the species are new to our collection. I have looked them over yesterday and give you herewith some notes:

- No. 1. *Scolytus ventralis* Lec. Agrees with specimens thus determined by Hopkins and myself but we have not compared them with the type. *Colonies* of the numerous western species of *Scolytus* are greatly desired in order to ascertain whether the abdominal armature is a sexual or specific character.
- No. 2 *Micracis hirtella* Lec. Probably the ♂, but according to Hopkins, the ♀ of the species thus described by LeConte. Your specimen differs from LeConte's description and from the specimens collected by Coquillett in the structure of the antennae, the club being longer and the sutures distinctly curved. *Colonies* of these things are greatly desired. They live *within* the terminal twigs of deciduous trees. A specimen of the second South Californian species of *Micracis* will be sent to you.

A good list of the Coleoptera from southern California would be of great interest, and if you include the desert regions of eastern California I should gladly place at your disposal the list of species collected by Hubbard at Palm Springs, Cal. in early spring of 1897. It contains various undescribed species and several new genera.

Since the publication of Hubbard's Dinapate letters I have received 14 applications for specimens and there are only six specimens in our collections of which only one is absolutely perfect. It was the most difficult thing to breed this species and in spite of all possible care and attention the specimens crippled themselves in trying to emerge from the larval galleries. Of course I shall send you a specimen.

Yours sincerely,

E. A. SCHWARZ

Washington, D. C. April 13, 1899.

Dr. L. O. Howard,

Hon. Curator, Department of Insects, U. S. Nat. Museum.
Sir:

I have the honor to transmit to you herewith a framed portrait of the late Mr. Henry G. Hubbard. In view of what Mr. Hubbard has done for American Entomology in general, and; more

particularly what he has done for the collections of the U. S. National Museum, it seems to me appropriate that the portrait should find a place in the rooms of the Department of Insects at the National Museum.

Respectfully,

E. A. SCHWARZ

Washington, D. C., May 3, 1899

Dear Mrs. Slosson,

If you have one or two Floridian specimens of *Anthonomus brevirostris* to spare I should be very glad to get them for the Nat. Museum collection. I see from Linell's description (Journ. N. Y. Ent. Soc. V, 1897, p. 50) that he mentions the "slight aeneous lustre" but this lustre has either disappeared in the type specimens, or the light in the office is too poor (the windows are never cleaned), or I have become a little color blind.

Typical specimens of *Sunius binotatus* look of course quite different from the pale form you sent me but if one has large series of specimens from all over the South it becomes impossible to fix specific limits. Not only the color but even the length of the elytra are variable. In the course of time, this species will be broken up into several "species" but for the present it is by far safer to refer your specimen to a variety or race of *S. binotatus*.

By all means please describe *Cossonus hamiltoni*. Take as a model Dr. Horn's description (in Proc. Amer. Philos. Soc., Vol. XIII, 1873, p. 439-440) of *C. crenatus* or *C. corticola*, and it will be easy for you to draw up the characters. The sudden and almost transversely-quadrangular dilatation of the beak, together with the sculpture of the thorax and the peculiar coloration (upper and underside) are sufficient for the recognition of this species. I have gone through the literature as far as it is accessible to me but fail to find that it has been described from the West Indies or Central America. I should be greatly pleased to look over your description and criticize it if necessary, and if you need examples of our N. A. species of *Cossonus* for comparison I should gladly send you a full set.

Yours sincerely,

E. A. SCHWARZ

Washington, D. C., May 12, 1899

Dear Mrs. Slosson,

I am greatly obliged to you for the two specimens of *Anthonomus brevirostris* which you sent with your favor of the 9th and which I have placed in the collection of the U. S. Nat. Museum.

Your description of *Cossonus hamiltoni* is an excellent one and could well be published just as it is. I notice in my series of 6 specimens (found by me at Lake Worth under old bark of *Sideroxylon masticodendron*, in June, 1887) that "the little central carina at the apex of thoracic depression" is an evanescent character and that it would be preferable to mention the smooth longitudinal median line. The sculpture of the underside should also be mentioned. I enclose a transcript of your description with a few additional characters incorporated.

The second *Cossonus* which you send is a species quite unknown to me, provided it is not an abnormal specimen. It has nothing in common with *C. corticola*.

Yours sincerely,

E. A. SCHWARZ

Washington, D. C., Febr. 10, 1900

Dear Mrs. Slosson,

I was greatly pleased to learn from your letter that you are again in the sunny hunting grounds of Lake Worth.

The small weevil reached me in somewhat dilapidated condition but is still determinable. Some years ago I had determined the species as *Limnobaris limbifer* Casey, and the determination is probably correct. In 1875 Mr. H. G. Hubbard and myself found two specimens in the sand along the inner shore of the Indian River, at old Ft. Capron, where there is no *Uniola* but some other coarse grasses. One specimen I sent then to Dr. LeConte but it has never been described by him, probably because he thought it was rubbed. It may be that Capt. Casey's type specimen from Florida originally came from the LeConte collection.

While I was at Lake Worth, in June, 1887, I pulled up several *Uniolas* and looked at the roots but failed to see specimens of the

weevil or any sign of injury to the roots. From what you say I have no doubt, however, that the larva will be found to bore in the roots or rootlets of the plant, and do not think that it bores in the stem above ground.

There is very little known of the life history of our Barini: a few develop in dead twigs, others are stem borers above ground, but most species (including the genus *Limnobaris*) are no doubt boring, in the larva state, in the roots of living herbaceous plants.

Yours very sincerely,

E. A. SCHWARZ

P. S. I would have answered your letter sooner, but being attacked by rheumatism I was confined to my room for the past week and found your letter only yesterday on my office desk.

E. A. S.

The Hughes Hotel,
Fresno, Cal.

March 11, 1900

Dear Dr. Howard,

I arrived here safely this afternoon, nine hours behind time, and telephoned at once to Mr. Roeding. But I only got Mrs. Roeding who informed me that Mr. Roeding had gone to his Foothill farm and that he would come down town early tomorrow. Mr. Dodd, the Hotel proprietor, also informed me that the Roeding family temporarily live now in his hotel but for to-day (Sunday) they are all on the farm.

My trip was rendered very unpleasant on account of the overcrowded cars and there was no sleep for me since there were four babies on board. I was greatly impressed with the beauty and grandeur of the pine region between Flagstaff and Williams, Ar. In certain localities many of the trees are dying but whether from the effect of the fires or from injury by a *Dendroctonus* I could not make out from the train. A Minnesota lumberman, who goes almost every year to Arizona and who is well acquainted with the Arizona pine region told me what he knew of the timber insects and from his account I infer that a *Monohammus* larva is the most injurious insect.

My first impression of this valley of California is that, with the exception of the plants growing on the prairie and the few oaks and willows along the river, the whole flora is an introduced one, and consists of a most remarkable mixture of tropical and northern species. The *Washingtonia* palm, the date palm, the various *Eucalyptus* etc. form a strong contrast with the wheat fields and apple orchards. I wonder why they do not raise oranges or cotton here. In coming up the valley (or rather down the valley) I noticed but few fig trees from the car window and only one large fig orchard. This was near Bakersfield, and the trees were still entirely bare of leaves.

The spring flora of the prairies is in full bloom now and even on the western slope of the Tehachapi Pass various species of *Ceanothus* and a lot of other plants quite strange to me are in flower there. The cultivated plants are however still very backward; wheat and alfalfa are still very small and of the orchard trees only the peaches and a single variety of pear show spring life. Some butterflies are about but they resemble most desperately our eastern species—*Danaïa archippus*, *Vanessa antiopa*, *Pyrameis hunterae*, *P. cardui* etc. I have not yet captured a single insect.

Yours ever

E. A. SCHWARZ

The Hughes Hotel
Fresno, Cal. March 12, 1900

Dear Dr. Howard,

Yesterday evening I got Mr. Geo. Roeding per telephone. He will come in town this morning at 9 o'clock and fetch my traps and myself out to his ranch. The famous Californian weather seems to exist only in imagination, for there is today a damp fog as thick as a genuine London fog. I have been running about town since 7 o'clock to get the many things one wants for a prolonged stay in the country and to make arrangements with the Express and Post Office. The banks are not yet open, so I could not attend so far to my money affairs.

Please address letters packages etc. c/o Mr. Geo. C. Roeding.

Yours sincerely,

E. A. SCHWARZ

Roeding Ranch
near Fresno, Cal.
March 13, 1900

Dear Dr. Howard,

Yesterday morning, Mr. & Mrs. Roeding arrived in town; they are both charming people and I had at once a long talk with Mr. R. on the fig question. He promised to have his wagon ready at once to carry me out to his ranch but expressed his regret that he could not accompany me since his nursery business kept him in town. In fact, as I wrote you before he is now living in town. There was a delay of several hours before the wagon come and it was 3 o'clock P.M. before I arrived at the ranch. Mr. Roeding had insisted that for the present, I should occupy his house but on my arrival the key could not be found nor the foreman, Mr. Fisher, who was supposed to know where the key was. Finally toward the evening everything was arranged and I am the sole occupant of Mr. Roeding's house and take my meals with the men. The financial side of this arrangement has not yet been settled. The fare of the men is of course very simple but good enough for me; the drawback is that breakfast is at 5:30 A.M.

Mr. Fisher is also a very busy man and had just time yesterday evening to show me over the place and especially the fig orchard with the row of Caprifigs and the remnant of the tent. (?) So, I started out early this morning and began investigation alone, the weather being fine and quite warm.

I am afraid it will be quite difficult for me to fix up here an entomol. laboratory, unless I can get a room in Mr. Fisher's small house; for I would feel quite uncomfortable in Mr. Roeding's house when the family returns, but the matter will be settled as soon as Mr. Roeding comes out the next time.

Yours sincerely,

E. A. SCHWARZ.

Washington, D. C., February 11, 1901.

Dear Mrs. Slosson,

Having been in California for nearly one entire year I found upon my return to Washington on my desk an astonishing

accumulation of letters and boxes of all sizes. The latter contain at least 10,000 specimens of Coleoptera—mostly for determination, and it will take several months' hard work to dispose of them. There is no question that in one of these boxes there will be the Tachys and the Haliplus from Florida which you have been kind enough to send me. However I have not yet been able to dig out the box

As I wrote you before I take a most lively interest in the insect fauna of tropical Florida and shall always be greatly pleased to see and determine anything in the line of Coleoptera you may send me. Of course I cannot promise you that I shall be able to name for you the "puzzling" specimens you refer to in your letter of February 8th but I shall do all I can.

Yours sincerely

E. A. SCHWARZ

Washington, D. C., Febr. 21, 1901

Dear Mrs. Slosson

I think you are greatly mistaken in stating that "collecting is very poor" at Miami; for the little Rhyncophorid beetle you send me with your favor of Febr. 16th is worth four or five trips to Florida. I had never seen it before and it represents a family new to the fauna of North America. It belongs to the family Allocorynidae and to the genus Allocorynus Sharp. There is only a single species described, *A. mollis* Sharp which is quite distinct from that you found. The family belongs in the neighborhood of the Rhynchitidae but is well characterized by the small palpi, the peculiar mode of insertion of the antennae (on the underside of the beak), the remarkable form of the tarsi, etc. Your species should by all means be described at once, and if you will draw up a description I would gladly assist you. As a matter of course I would like very much to get a specimen for our collection at the National Museum and I urge you to spare no effort to find additional specimens. Do you remember under what conditions you found the specimen.?

.

I have finally found the box you sent me last year containing the Tachys and Haliplus for which I thank you greatly. We

have plenty Floridian specimens of that new *Erechomus* and the *Bryoporus*, so I have not made use of your kind permission to retain the specimens.

Yours sincerely

E. A. SCHWARZ

Williams, Ariz.

May 25, 1901

Dear Dr. Howard,

Herbert and myself arrived here safely this morning. Owing to the prevalence of coal dust and coal smoke, my cough started badly after leaving St. Louis and to make the matter worse we ran at Albuquerque into a terrific sand storm which still continues.

The country here around is extremely mountainous but looks very promising entomologically, so that in the course of time we should be able to make a good collection. My outfit is extremely defective and I hope to get from you the necessary implements, especially in tin boxes in the course of a few days. Wrapping paper is also quite desirable since this place is a poor market.

I had been careless enough in Washington to leave the arrangements for this trip to Mr. Ashmead but he mismanaged the whole thing and it turned out that we would have to stay in that great cattle yard, called Kansas City, one entire day and the best part of the next day. I could not stand that and so we abandoned Ashmead and left him in the lurch i.e. in Kansas City. This evening, however, he came along with the Fish Commission people, and we said the party good bye in full view of that splendid mountain, Ben Williams, which arises immediately behind the town.

The air is splendid here and as soon as this hurricane stops we shall go in the woods which extend to within 2 minutes walk from our hotel.

Yours sincerely,

E. A. SCHWARZ

Williams, Ariz.

June 1, 1901.

Dear Dr. Howard.

We are here only six days but it appears quite evident that we shall bring together a large and valuable collection and this in spite of the fact that I can do myself but little entomological field work at present being still unable to climb the smallest hill. This region is, entomologically, of extreme interest: there is the queerest mixture of boreal and lower Sonoran species. The season is too early now for a full development of the insect fauna and the bulk of the herbaceous plants and insects probably make their appearance not before the beginning of August. The country around Williams is of the same character as that around Flagstaff except that instead of the San Francisco Mt. we have here Ben Williams Mt. (9800' high) which will most probably not be ascended by me. The whole region is thickly covered with lava blocks of all sizes; there was originally on the hills and mountains a rather dense growth of Coniferous trees (Pines in the lower and spruce in the higher altitudes), with small oak trees and a few other species of shrubs interspersed. There is a very scanty but quite varied growth of herbaceous plants in the hills while the great open plateau north of this town is covered with sage brush. The greatest drawback for this region, besides cattle, sheep, donkeys, etc., is the presence of the Saginaw Lumber Co. which since a number of years is making the most strenuous efforts to convert these hills and mountains into a naked wilderness of rocks. Moreover this entire region is frequently overrun by fires. I do not believe that I shall see a single acre of virgin forest. I send you this with a small portion of the collection made by us thus far, in 4 packages and consisting of 8 boxes.

Cigar box No. 1 does not need any attention except that the three vials in the top layer (containing lizards etc. collected by Herbert) should at once be turned over to Dr. Stejneger's department of the U. S. Nat. Museum.

No determinations of species sent herewith are requested but I would like to know whether or not the boxes arrive in good conditions; and, further, whether or not I shall continue to send on living material.

Many thanks for the outfit you sent me and which arrived in good condition. This city is the worst place for getting supplies I ever met with: not even packing paper and string can be obtained here, and what little can be obtained is at exorbitant prices ($\frac{1}{2}$ pint of alcohol 50 c)

I think my health is improving, at least my cough has subsided but it takes me still one hour to climb 100! For the present the base of the little hill only 5 blocks away from our hotel furnishes ample opportunity and material for collecting. But even to reach this place requires the laborious ascent of about 50 feet.

Yours sincerely,

E. A. SCHWARZ

P. S. Inclosed please find list of material sent herewith.

P. S. Please send me a few sheets of manila wrapping wrapping paper; also a ball of string; please also return the tin boxes, and finally please tell Tom to pack up and send me, in several good boxes, the vials and corks I left in my private room.

E. A. S.

P. S. My address is Tollfree Hotel, Williams, Ariz.

Williams, A.,

June 11, 1901.

Dear Dr. Howard,

Strong winds continue to blow here day after day and not only interfere somewhat with entomological work but also seem to retard my recovery. I make it a point to make two short excursions every day, and I think I am somewhat improving. At any rate my circumference has decreased more than 3 inches during the past fortnight but my climbing capacity is still extremely limited.

Our entomological collections are fast increasing. The insects affecting Coniferous trees are of course taking the front rank in interest and I wish Dr. Hopkins with his herculean strength and big axe were here to help us. For the present I have to confine myself to the study of the insects affecting Pinus. The Spruce zone commences at about 7500' elevation and it is very doubtful whether I shall be able to get so high up.

In looking over the wooded hill-sides in the Pinus-zone one sees here and there a dead tree. Many of these trees have been examined by us and I have come to the conclusion that most, if not all of them, have been killed by the Dendroctonus. There appear to be three species of this genus on these mountains (there may be one or two more higher up) of which two attack healthy trees so that the latter succumb sooner or later. Both species seem to be undescribed. The third species which is flying about everywhere in great number has, strangely enough, not yet been found by us *in situ*. It is possible, however, that this species is imported in pine logs coming from the southern slope of Ben Williams Mt. We got between 14 or 15 species of Scolytids in all from Pinus sp. (5 undescribed among them) of which we traced the life history of 8 species but none of them appears to be primarily injurious to the pines. They are merely followers of the Dendroctonus.—The oaks furnish thus far only one (not injurious) species of Scolytids, *Micracis* n. sp., while in the Aspen we discovered a wonderful new genus of Scolytids with a most remarkable life history. The Juniper (not *Arbor vitae* as written in my previous list) has one, apparently *not* injurious Scolytid (*Phloesinus* n. sp.) of which we have hitherto found only the galleries and dead imagoes. As stated before, the Spruce Scolytids have not yet been studied by us.

I have your letters of May 31st, June 1st (from Perm. Sec'y A.A.A.S. being a bill !!!) and June 7th, as well as ALL supplies for which I cordially thank you.

There is still spring weather in this elevated region, and before the beginning of the rainy season, which is about July 7th it is hard work to find many new things in Coleoptera. A Microlepidopterist, however, would find plenty of work even now. Larger Hymenoptera such as Apidae, Vespidae are still scarce and most of the spring flowers seed without the assistance of insects. Ants abound but belong all to well-known genera. Microhymenoptera are extremely plentiful though I suspect that more than one-half are parasites of Cynipidae and Aphids. I have not yet seen a single Diaspinous Scale; in fact found only two species of Coccidae; a common-looking *Rippersia* among a common-looking *Lasius*, and a *Dactylopius* on the roots of an

unknown plant. Not a single wild Roach seems to occur here (though we have plenty of Croton bugs); Acrididae are fairly numerous in specimens but few in species. Diptera are fairly numerous; the troublesome species here is not the house fly but *Lucilia caesar*. A big mosquito occurs here as a great rarity (hitherto only 3 specimens found) but we have not yet seen the larva. A few dragon-flies and some big aquatic beetles live in the artificial storage ponds and are no doubt recent advents from California.

Yours sincerely,

E. A. SCHWARZ.

P. S. Please send some more franks.

Williams, Ariz., June 14, 1901

Dear Dr. Howard,

I am somewhat disappointed at the slow progress of my recovery but still there is a progress visible. I am loosing in weight and stomacic circumference and am on favorable days able to make two excursions of about two miles each, provided there be less than 200' of climbing. Entomology suffers considerably under these circumstances since Herbert shows but little circumspection and never collects anything of value if I am not with him. This region is evidently very rich in insects in spite of its arid character and if I were in good health our collections would be quadrupled in number of species.

The cheapest tickets we could get at Washington were excursion tickets to Prescott. This requires our going to that place shortly in order to have our tickets stamped and signed for the return trip. So I propose to leave Williams early next week and to procede to Prescott via Ashfork where we will make a short stop in order to see what kind of fauna is on that place about 1000' lower than Williams. We shall return to Williams but when I cannot foretell at present. This depends on the luck we may have in collecting at Prescott. Fort Whipple is in the immediate vicinity of Prescott and from that place Dr. J. L. LeConte published many years ago a list of Coleoptera said to be collected by Dr. Elliott Coues. Ever since I got interested in the fauna of Arizona I strongly suspect that these things were

never collected at Ft. Whipple but much nearer to the Colorado plateau. In fact I feel pretty certain that they were collected in the upper Rio Verde Valley and not by Dr. Coues but by Dr. Edward Palmer. I think that a stop of 3 or 4 days at Prescott will dissipate any doubt about this point.

Williams is an expensive place and funds are running down rapidly. If I am gathering strength I would like very much to make upon our return to Williams, the trip to the Colorado cañon and, on our return trip to Washington, stop over for a week or so in the vicinity of Las Vegas, N. Mex. All this requires additional funds and I beg you now to send me, ON JULY 2ND OR 3RD, \$130 per money order addressed E. A. Schwarz Williams, Ariz. Please omit "Tolfree Hotel" in the address, and do the same in all letters you may write me to Williams between now and July 2nd or 3rd. I shall write you from Ashfork or Prescott or wherever we may be during the next fortnight where to address me after July 2nd.

A large number of Department franks were unexpectedly found among the envelops you sent me but an additional supply (especially of the smallest sizes) can do no harm.

The weather is much cooler here than I expected but since there is but one thermometer in town which constantly indicates -15° I cannot tell how warm or cold it has been here since our arrival. We have had only one warm day and on that day all sorts of insects were swarming. Yesterday afternoon we had quite a snowstorm and this morning Ben Williams Mt. shows a white cap.

I made the acquaintance of Mr. Dumont (or Dermont?) the manager of the Saginaw Lumber Co. At first he treated me rather coolly because, as I afterwards found out, he suspected that we were agents of the Interior Dep't. to look after the lumber stealing of his company. But he gradually thawed out and has invited us to make use of his lumbering railroad which runs about 20 miles south of Ben Williams Mts. into the very depth of this great forest of conifers.

How are the Proc. Ent. Soc. Wash. going on?—Please give my best regards to all the friends at the Dep't and elsewhere in Washington.

Yours ever,

E. A. SCHWARZ

Williams, Ariz.

June 17th, 1901

Dear Dr. Howard,

On Saturday last there was, in the early morning, ice on the little water (overflow of a windmill) that is to be found in this vicinity, but during the course of the day a change in the weather took place and real summer weather has since prevailed. I enjoyed the heat very much, was out in the open air most of the time on Saturday and Sunday, basked in the warm sunlight between the great boulders, and for the first time commenced to feel quite comfortable. Unfortunately the packing this morning quite upset me again at least for several hours.

During the three weeks of our stay here we made a valuable collection of Coleoptera although only a fraction of the fauna has been collected by us. Of the other orders we collected a mass of material which may or may not be of much value but which, at any rate, contributes to the knowledge of the fauna of this interesting region.

Herbert Barber sent on to the U. S. Nat. Museum a small portion of the plants collected by him. Since among these plants there are several upon which we found certain species of insects I would beg you to see that these plants ARE NOT DISTRIBUTED before our return to Washington. Herbert has written about this matter to Mr. Currie but I am afraid that his request will be disregarded.

Please let me know whether or not I shall send on LIVING caterpillars or other larvae. The package I mailed to you this morning contains such caterpillars. If they should make any trouble they can be thrown away.

We expect to leave here at noon for Ashfork where we may stay a few hours or a day according to the insects we find there. Last year when I passed that place I was favorably struck with it for the reason that there is not a single tree nor any other plant to be seen anywhere near. So there should be some very interesting insects there.

I have made arrangements with the postmaster here to have our mail forwarded, so please continue to write me to Williams, but omit "Tolfree Hotel."

We expect to return here in the first week of July, or sooner if we do not find any favorable collecting ground at Prescott or vicinity.

We found here the other day a little cocoon which I take for that of a *Limneria* which jumps far better than any jumping seed or *Cynips quercus-saltatorius* I ever saw. Unfortunately only one specimen has thus far been found.

Yours sincerely,

E. A. SCHWARZ

P. S. I read the other day in the Williams Calamity Howler that a party of scientists has been eaten by the natives of some of the Pacific Ocean islands. If that party consisted of Mr. Ashmead and the Fishery Commission men I feel sorry for the natives.

Prescott, Ariz., June 19, 1901.

Dear Dr. Howard,

Last Monday we left Williams at noon and one hour afterwards reached Ashfork which is about 1200' lower than Williams but still in the volcanic region. There was a fine warm temperature of about 95° and in spite of the most desolate character of the vegetation we managed in the course of a few hours to make quite a collection of insects none of which we had seen at Williams and most of which (of the Coleoptera) are quite new. A few Junipers, Berberis and Lyciums constitute the arborescent flora while of the lower plants most of them were quite unknown to me. We stopped over until Tuesday afternoon and proceeded to Prescott. Here we have reached that region where, thanks to the goodness of Nature, washwater is very scarce and drinking water obtainable only with much trouble. The temperature is, however, quite lively, about 95° in the shade and seems to agree with me very well, for I was able this morning to walk across three ravines each about 150 feet deep and to do much more entomological work than Herbert who collapsed on account of the heat and absence of ice water. I collected quite a number of species of Coleoptera but not a single species of those mentioned by LeConte as occurring here. However one days experience is not enough to form a judgment of the character of the fauna.

There are again large Pines on the rocky hills around the City but the oaks are those of southern Arizona (*Quercus arizonica* and *Q. emoryi*, the latter plentifully supplied with Cockerell's Brachyscelid gall), and the Coleoptera and other insects found thus far remind me more of southern Arizona than of the plateau region. Prescott is more than 5000 feet high! Since I see that this warm and dry climate of this region is manifestly most beneficial to me I have decided to run farther down the road and spend a week or so at Hot Springs which is said to be a beautiful spot situated in a cañon where the temperature is about the same as at Yuma. If Herbert cannot stand the heat and absence of ice water I shall send him back to Williams where I could join him when summer temperature has reached that elevated region.

Before leaving Williams I received your letters of June 10th and June 12th. I have made arrangements to forward my mail to Prescott or Hot Springs.

Yours sincerely,

E. A. SCHWARZ.

(Castle Creek) Hot Springs,

Ariz., June 27, 1901.

Dear Dr. Howard,

Since last Saturday we have been at this out-of-the-way place in the midst of one of the wildest and most rugged surroundings I have hitherto seen in the West. Hot Springs is apparently within the very heart of the Wickenburg Mts. but since Castle Creek Cañon in which the springs are, is extremely deeply cut in, the altitude of the place is not quite 2000'. The flora and fauna remind me somewhat of those at Catalina Springs near Tucson but there are various trees and lower plants here which are unknown to me. The insect fauna is of course radically different from that of Williams, but on the other side, also different from that of any point in southern Arizona visited by Hubbard or myself. There has not been any rain here since last January and the whole country is dreadfully dried up. There is not a single flower here and even good-sized bushes are dried up. Insects are comparatively scarce just at this season but we made a fine collection in the waters of the Hot Springs (temperature

98° to 115°) as well as on the Acacias, Palo Verdes, Mesquites etc.

The climate is delightfully warm; as soon as the sun comes up, it is never below 90° and at 2 o'clock p.m. we had it during the past week never below 105°, and on last Sunday we enjoyed 111° in the shade of *the* cottonwood tree. Under these conditions, insect collecting during daytime is quite unprofitable so we make our excursions from 5 to 8 o'clock in the morning and from 7 to 11 o'clock in the p.m.

This congenial climate and the bathing in the hot springs did me good; we took it easy, never climbed up the forges and never extended our excursions farther than half a mile.

Herbert got sick on the third day of our stay here on account of the great heat and more especially on account of excessive water drinking; but has now recovered. There is no other water here than that furnished by the hot springs and this is full of alkali and soda. This water is put in ollas and this brings its temperature down to about 85°. Every second day the stage brings a little ice down from Prescott, but this lasts only for a few hours.

We intend to leave here tomorrow and to return directly to Williams from which place I shall write you more about the insect fauna of Hot Springs.

I received here your letters dated June 15th (inclosing one from Hopkins), June 18th and June 20th; many thanks for them.

Please tell Mr. Clifton not to send Science to me. The Williams "Calamity Howler" is by far more satisfactory.

Yours sincerely,

E. A. SCHWARZ

P. S. The temperature in my room where I write this letter is 102° but since there is here no perspiration, one feels quite comfortable.

(Commercial Hotel)

Flagstaff, Ariz,

July 2nd, 1901

Dear Dr. Howard,

A serious disaster has overtaken us, and the only consolation is that we are still alive. We returned to Williams on June 29th

and had hardly fixed ourselves and our traps up for a thorough summer exploration of the country around Bill Williams Mts. when—this morning at 2³⁰ o'clock fire broke out in the town which spread with incredible rapidity. The Tolfree hotel was a mass of flames 3 minutes after the first alarm and 15 minutes later more than one half of the town was afire. The electric light had got out of order since the previous night so that when the alarm came our room was in complete darkness. It was impossible to save anything except those things one chanced to grab in the darkness.

Besides the loss of nearly all my clothing (Herbert lost his shoes and all his underwear) we lost our entire entomological outfit except those things that happened to be in our pockets or in our light satchels. I saved pocket book and our round-trip tickets, H. saved his box with pinned Micro-insects but lost his two lenses. I mourn the loss of my old entomolo. vademecum, all the entomolog and other books, my opera glass and all my jewelry (fortunately only 3 shirt buttons). But to my infinite regret we lost our entire biological and alcoholic collection made at Hot Springs!!

Since of the 3 hotels at Williams, two were burned out and the third badly scorched we took the early morning train and ran over to Flagstaff in order to refit and to consider further steps.

The disaster has of course crippled us badly and after running about for an hour I find that only a few of the lost things can be purchased here. The whole outfit sent me by the Department is lost, and when I shall have decided what to do now I shall take the liberty of asking you for at least some additional material.

The post office building at Williams was saved by some miracle.

One thing I beg you to do upon the receipt of this viz. to telegraph to Flagstaff (Commercial Hotel) whether the \$130 have been sent to Williams.

We are somewhat used up for the present, and the entomol. results of this trip will be considerably curtailed in the future but that our spirits are not broken is proven by the fact that 4

hours after our arrival here we made a little entomolog. excursion and found a new genus of Coleoptera.

Yours sincerely,

E. A. SCHWARZ.

Flagstaff, Ar.,

July 4, 1901.

Dear Dr. Howard,

The worst feature of the burning of Williams, as far as it concerns ourselves, is that thus far I have no definite plans for the immediate future. Entomologically, we are badly crippled and all I could buy here at Flagstaff are chisels, hatchets, alcohol and pill boxes. Even if you are kind enough to send us another outfit, the loss of our nets, net sticks, umbrellas, sieves etc. can not be replaced here. We saved accidentally a dozen of empty vials of various sizes also 3 cyanide bottles but not a single box and only one collecting forceps.

Williams was by far the most favorable place for an exploration of this plateau; the surroundings of Flagstaff consist only of barren pine woods which have been ruined years ago and which cannot possibly furnish us much new material. There being no other stopping place on the plateau and the region east and west of the plateau along the Santa Fé R.R. being the most desolate desert, I fear we have to abandon any further exploration of northern Arizona and to retreat to Las Vegas, N. Mex. However, I shall try everything to stay on the plateau and I see two possibilities: 1) to re-establish our headquarters at Williams as soon as matters get quietened there; 2) to run to the Grand Cañon and stay there provided the hotel be not too expensive. Since every hotel and every store at Williams are burned, it is very doubtful whether we could find lodgings in that part of the town which is still standing.

At any rate we shall run over to Williams, as soon as I get the supplies from Washington which you kindly promised us and then let you know about our further movements. Do not write to me after the receipt of this letter until you hear from me.

Another bad consequence of the Williams fire is that owing to the excitement and to the inhaling of dense smoke my asthmatic

spells and my cough have returned so that I am not able to climb the slightest hill. However, I feel confident that this magnificent climate now prevailing on the plateau will speedily do away with these annoying things.

Yours sincerely,

E. A. SCHWARZ

Williams, Ariz.,
July 29, 1901

Dear Dr. Howard,

From day to day we are delaying our departure from Williams for the rainy season is now fairly upon us and many species of insects hitherto not noticed by us emerge from their long winter and summer retreats. However since money and time are getting short we shall leave here tomorrow and proceed to Las Vegas making only one short stop at Winslow.

We have hitherto been exploring only the region of Pinus, i.e. Merriam's Transition zone, but since of late weeks I commence to get somewhat stronger we have extended our excursions to the lowest Spruce zone, or at least to that portion of the plateau where Spruce trees are getting numerous. A beautiful cattle trail very gradually leads up one of the cañons to the very base of Ben Williams Mt. and since the distance from the town to the spruces is not more than $2\frac{1}{2}$ miles with only one sharp ascent of about 200 feet, I was able to visit the Spruces several times. Very few spruce trees have been cut on the mountains and since few fires have ever entered the spruce belt the cause of the dying of spruce trees, young or old is most probably insect work. No wholesale destruction of trees takes place but here and there a dead or dying tree can be seen. The trees die from the top; consequently insect borers must be the cause, and, we found that a species of *Scolytus* (probably identical with the distinctive species observed by Prof. Hopkins in the northwest) is most probably the primary cause of the death of the trees. Nothing that is absolutely certain can be said on this point, for the investigation of these tough trees is immensely more difficult than that of the pine trees, and the two pieces of spruce bark which I sent you and which show the work of the destructive *Scolytus* repre-

sent a couple of hours' hard work on the part of Herbert and myself. Another species of *Scolytus* (probably *Sc. unispinosus*) seems to live only in the branches of the spruce and is no doubt of secondary importance. A *Pityophthorus* lives in the thinner branches and has no importance. There is also a *Hylesinus* living on Spruce but we failed to find a colony of this species. Hopkins found that a Buprestid, *Melanophila drummondi*, is primarily injurious to spruces in Idaho. Here we found one or two species of *Melanophila* on and in spruces but not very common and only in such trees as have been nearly killed by the *Scolytus*.

Various other insects, among them several undescribed Coleoptera, occur here on spruces but a thorough investigation of the fauna of this tree cannot be made by us this time. Even the fauna of *Pinus* is not fully collected by us although plenty of trees are close at hand. Thus, since the begin of the rainy season we notice a *Pieris* (*Pimenapia* ??) getting quite abundant on the pine but since it occurs only in the very tops of the tall trees we had no chance of getting specimens of the butterfly or its larva, except that a big spider was once good enough to grasp one of the butterflies and drop with its prey to the ground.

I really forget now whether or not I have acknowledged to you the receipt of the second relief box, containing cyanide bottles, cork, insect pins and corked boxes. To-day I received quite unexpectedly a third relief package containing enveloppes, franks, writing paper etc. My best thanks for all these things which, all of them, are very welcome.—We dug for some time in the ruins of the Tolfree Hotel in the hope to recover the metal parts of our netsticks but failed to find anything.

I also have your letter of the 25th and I know that I shall find various other letters from you at Las Vegas. I expect to return to Washington sometime next month.

Yours sincerely,

E. A. SCHWARZ

East Las Vegas, N. Mex.

August 2, 1901

Dear Dr. Howard,

We left Williams on July 30th, spent the 31st in collecting at Winslow, about 50 miles east of Flagstaff and have just now arrived at EAST Las Vegas, N. Mex.

There is a confusion about the correct name of this place of which I was not aware before and I should be addressed at East Las Vegas, N. Mex.

I find here your letters (3) of July 20, July 22 and July 23, which I shall answer as soon as I get settled somewhere.

For the present I shall confine myself to one subject: I find also here two letters from Mr. Busek informing me that he has to go to Cuba and asking advance of money from me. I have written him with this, enclosing a check of \$200⁰⁰. Now, it may be (and I think it is so) that I have still sufficient money in my bank to cover that check. But it may be otherwise and since you have probably my July salary on hand I would beg you to be kind enough to see that Busek gets his money, either from the bank directly, or by means of the sum you have in hand for me.

Yours in greatest hurry

E. A. SCHWARZ.

P. S. I see that this place is full of proclamations of T. D. A. Cockerell regarding plants, insects etc. but he himself is out of town.

Las Vegas Hot Springs,
N. Mex.,
August 18, 1901

Dear Dr. Howard,

I have to beg your pardon for having so long delayed answering your letters and more especially that of July 20th. I make it a point to be in the field the whole day, and for some weeks even in the evening, as there is now some night collecting since the begin of the rainy season. Thus I am always dreadfully tired after the day's work and by no means inclined to do any letter writing.

There has been some indecision regarding my plans: Your kind permission to stay out in the arid region for the entire summer is a most tempting one but on the other side the expenses of this trip have by far exceeded my estimates so that I have made up my mind to return to Washington some day this week.

My health is vastly improved by my stay out West but the root of the evil still remains and I dread a winter in Washington

climate and its consequences. Now, I am greatly obliged to you for your proposal regarding the trip to Texas next winter, and most gratefully accept this very kind offer. I am strong enough to do any amount of effective field work in a flat country like Texas but I feel uneasy regarding the nature of the work expected from me. The trouble is that I consider the case of *Anthonomus grandis* as a hopeless one as far as suggestions of remedial measures are concerned, but I hope you will give me definite instructions regarding work for the winter and early spring.

We have made here a very fine collection of insects (mostly of course Coleoptera) but of a quite different character than I expected. In order to understand more fully the fauna of the Transition zone as investigated by us at Williams, Flagstaff and the Grand Cañon it became advisable to visit another of the parallel ranges of the Rocky Mts. to make comparative collections. Las Vegas and its mountains are a little too far from the Colorado Plateau of Arizona but I did not know any point west of the Rio Grande of the requisite altitude that seemed fit for a stopping place (in coming east from Arizona I found out that Ft. Wingate would have been the best place); so we investigated the lowest position of the Transition zone at the mouth of the Gallinas cañon which is in the immediate vicinity of the Hot Springs. The leading plants viz. Pines, piñons, Junipers and oak shrubbery are here just as at Williams and even the Spruce trees descend to the very mouth of the cañon in shady places; but the insect fauna differs more from that at Williams than I expected. The reason or reasons of this difference are quite obscure to me for the present.

During this expedition we have made a very large collection—much larger than I anticipated after the first week's experience. The collection is in my opinion a very valuable one and, should it have arrived in Washington in good shape, will form an important addition to the Nat. Mus. collection. It will, however, require several months's work to mount the specimens.

I hope you have safely reached Denver and I would congratulate you for having escaped for some time the office life of Washington but for the fact that you are the Permanent Sec'y A.A.A.S. and consequently will have little time for recreation.

Many thanks for attending to my money affairs; the statement you inclose in your letter of the 12th is quite satisfactory, but I shall have many expenses upon my return to Washington. The salary voucher blanks you mention in the same letter have not reached me.—I never received a copy of your Fig article; as a matter of course, all the copies of my own article are at your disposal.

To-day is the first really "rainy" day we experienced on this trip. Of course it rains, since our arrival here, every day but they are short showers, though sometimes very severe ones. They do not interfere much with collecting though we are wet all the time.

Yours sincerely,

E. A. SCHWARZ

Havana, Cuba.

Febr. 16, 1903

Dear Dr. Howard,

I have just safely arrived here but to my great consternation I find that my baggage which I checked from Washington direct to Habana has not arrived with my steamer. I do not know how long it will take to recover it but since it contains besides all my collecting outfit I shall be seriously crippled for the next week or so as far as general collecting is concerned. It will however not interfere with my capacity of observing.

Mr. Ferrer has not yet made his appearance, nor did I find a letter from him at the hotel Pasaje. I hope to hear from him, however, tomorrow.

It is apparently very hot here but I suppose that within a few days I shall get used to the climate.

On the train from Jacksonville to Miami I had the great pleasure of meeting Prof. Comstock who intends to spend some time at Miami for the purpose of collecting spiders.

Civilization has extended largely all over tropical Florida, and my old collecting grounds of Lake Worth and Cocoonut Grove are quite irrecognizable to me and entomologically utterly ruined. This whole country is at present overrun and overcrowded with

American tourists and it was with difficulty that even here at Habana I got a dilapidated room at the Pasaje Hotel.

Please address me until further notice at Hotel Pasaje, Havana, Cuba.

Yours sincerely,

E. A. SCHWARZ

Habana, Cuba,

Febr. 17, 1903

Dear Dr. Howard,

I succeeded this morning in recovering my baggage which had been sent by mistake via Tampa, Fla., but it was hard work, for one is sent here from office to the other office before one gets at the right one. There remains only the trouble about Cayamas, for no one knows where this place is and still less how to get there. At the mailing division of the Post Office I was informed, however, that there is such a place in Santa Clara Province, and that it is a newly established post office. But that was all that they could tell me. I hope, however, that, as promised, Mr. Ferrer will be here to-day or tomorrow, or that at least he will send me instructions how to reach him. To make sure I have just sent him a note.

It is raining hard to-day and the air is very sultry.

Yours sincerely,

E. A. SCHWARZ.

Habana, Cuba, Febr. 18, 1903

Dear Dr. Howard,

It is still raining but I got finally into communication with Mr. Ferrer who through one of his Cuban friends sent me explicit directions how to reach his place. This trip with its several changes on the railroad and winding up with a 3 miles horse ride appears to me, in this strange country, much more formidable than a trip into the very midst of Arizona. Still I shall set out next Friday (day after tomorrow) when Mr. Ferrer will be kind enough to have his horses at the station.

In the meantime I found out that also in the Province of Habana several attempts are being made at cotton cultivation.

I am also informed that the country, wherever the soil is rich enough is full of a "wild cotton" (probably cultivated cotton run wild since many years). Capt. W. Hughes who is the manager of one of the numerous real estate companies that have been formed here since the war is greatly interested in this cotton problem and promised me to bring me out to several places in Habana and Pinar del Rey provinces where cotton is being cultivated on an experimental scale. However, he does not know anything about the *Anthonomus grandis*.

I called this morning on Dr. Fernandez, President of Acad. d. Ciencias and was most kindly received by him. He does not speak English so we conversed in French. All the publications of the Academia are placed at my disposal so I think I can complete our set of Gundlach's Fauna Cubana. He also gave me letters of introduction to various members of the Academy and also to Dr. José I. Torralbas who is Professor of Zoology at the University (Successor of Dr. Gundlach) and who seems to be the scientific factotum of this place. Unfortunately he speaks neither English nor French or German, but with some difficulty we went along moderately well. He informed me of the whereabouts of the Gundlach collection which to my surprise is not kept at the Academy nor at the University but at the Instituto del 2a Enseñanza (2nd Highschool). Armed with other letters I proceeded to the Instituto and was again very kindly received by the Director and the Professor in charge of the Museum, neither speaking anything but Spanish. However I spent a couple of hours examining the Gundlach collection of Cuban insects which is in absolutely perfect condition and certainly of great importance to us as far as the types are not preserved in the U. S. I saw the *Anthonomus grandis*, one specimen (with few exceptions all species are represented by a single specimen each) without specified locality and many other interesting things. The Lepidoptera alone suffer from exposure to light and will be lost within a few years. The collection comprises 160 small glass-covered and hermetically sealed, boxes and extends over all Orders. The whole being placed on vertical shelves along the walls only the lower portions could be examined a little more carefully. There are of course many unnamed

species in the collection and most of the Diptera are without names. Further particulars I must leave until I return to America.

In spite of the rain I had yesterday my first little excursion on Cuban soil: I took a boat and went to the foot of the old Morro Castle but it proved to be a miserable hunting ground: nothing but cosmopolitan weeds with a corresponding well-known insect fauna. Moreover I was finally ejected by a squad of U. S. infantry who informed me that without a pass from the Colonel no one was allowed to come anywhere near the Fort. That is Cuba libre!

Yours sincerely,

E. A. SCHWARZ

Address c/o Mr. Edward Ferrer, Cayamas, Cuba.

P. S. I was just closing this letter when Mr. Jos. G. King of this city called upon me. He is a young and energetic farmer from Alabama who has settled in Habana and owns several farms and ranches in this province. Since two years he has planted cotton (Sea Island cotton) and has made each year one bale per *acre*. He says that he had collected all the injurious insects to cotton he could see and sent them to the Agricult. Exper. Station at Auburn, Ala., but never heard any word from the Station. He is quite sure that there is no *Anthonomus grandis* in his cotton nor did he hear of it in the Provinces of Pinar del Rey and Habana. He will drive me out tomorrow to the cotton patches nearest to this City and also show me the 20-years old cotton plant which grows somewhere near by. Mr. King is evidently a good observer and you would greatly oblige me by sending him all the literature on *Anthonomus grandis* which you have at your disposal.

His address is Jos. G. King, O Reilly 38 Habana, Cuba.

E. A. S.

La Magdalena,

Cayamas, Santa Clara, Cuba.

February 20th, 1903.

Dear Dr. Howard,

After traveling one entire day over 3 Cuban railroads and for the last six miles on Mr. Ferrer's Cavita I finally reached

this much-out-of-the-way place and was most hospitably received by Señor Ferrer (who, by the way, is a Cuban by birth and has his name pronounced Ferrér). Having not the slightest idea of the location of the place, and the railroad ticket they gave me at Habana bearing a name I never heard before things looked rather gloomy. There is a change of cars at Matanzas and another one at Colon. Here I got the first definite information about the location of Cayamas which in fact is not a village nor a city but simply another name for Mr. Ferrer's plantation La Magdalena. This is situated about 5 miles of Yaguamaraz (which you find on any recent map of Cuba) in the southeastern part of Santa Clara Province, only 7 miles distant from the southern coast of the island and about 16 leagues west of Cienfuegos. According to Mr. Ferrer this is one of the wildest parts of the entire island, mostly savanna lands studded over, as is usual here, with innumerable Royal Palm trees. From time to time there are smaller or larger tracts of timber land but there are also vast stretches of what in Florida we call sawgrass prairie but there is no stagnant water anywhere except near the coast where there is a famous swamp (I have not caught the name) running parallel with the gulf.

Mrs. Ferrer who is a Canadian lady, also received me most kindly and I was given a fine room which of course is arranged like any other Cuban room i.e. there are no window panes and in order to see anything one opens the big door.

I wonder what I shall find out here; the country looks very promising entomologically. Wild cotton is said to be plentiful in the country but on coming here from Habana I saw only a single plant in the savannah besides many others growing in the gardens of the poorer class of the Cubans.

Yesterday, at Habana, I had my first experience with Cuban cotton. In the morning, Mr. Jos. King of Alabama came to me and we took the electric car to Vedada from which suburb a walk of half an hour brought us to a little garden near a negro shanty in which there were 6 cotton trees, one of which, now in nearly prostrate condition is said to be 20 years old. They belong manifestly to the Sea Island cotton variety but are much degenerated. There was certainly no *Anthonomus grandis* on these plants, nor

any cotton worms but a most conspicuous enemy of the plant is a *Phytoptus* which forms on the leaves a larger or smaller number of galls of the usual form but infests also the young clusters of buds and prevents their development. Another cotton insect conspicuous from its numbers is a *Dactylopius* which swarms at the base of each boll, protected by the "scales" of the flowers. Whether or not it is injurious to the bolls I could not determine. Shortly after breakfast (which is here between 10 and 12 o'cl., a.m. two Cuban gentlemen called on me. Señ. Manuel Peralta y Melgares and Señ. Felipe Perozo, the latter being dragged along by the former to act as interpreter, but in the course of the conversation it was discovered that Mr. Peralta can speak a little French; so we went along nicely. Mr. Peralta is a correspondent of the Department of Agriculture and greatly interested in the cultivation of cotton in Cuba and since he possesses various farms in the province of Habana he has on everyone a patch of Sea Island cotton. Time being short we went out to his private residence at Guanabacoa, about 7 miles from Habana where he has three patches of cotton. The largest one is Sea Island cotton, about one acre in extent, the soil according to Mr. Peralta himself being of very poor quality; and appearing to me a mere heap of stones. Nevertheless the plants were in splendid condition, a multitude of unopened bolls, some mature ones (a few days ago picking had taken place), very few flowers and few flower buds to be seen on the plants at this season. I failed to find any injurious insects on the plants excepting a single leaf harboring a rather numerous colony of Aphids which were fed upon by two specimens of *Scymnus leuroderus* Muls. (a species common also on Jamaica and Montserrat), and a solitary larger Coccinellid larva (probably *Coccinella sanguinea*). On the same field there was a gigantic cotton tree, at least 25 years old which Mr. Peralta declared to be "*Algodon silvestre*" i.e. the wild cotton of Cuba. I have never seen this variety before but from the shape of the bolls and from the nature of the fibre and seeds I presume it is a derivative of Sea Island cotton. There were likewise no insects injurious to this tree. The second, smaller cotton patch, is likewise in Sea Island cotton and did not harbor a single Antho-

nomus; a few leaves were found to be eaten into by a grasshopper but the author of the damage could not be seen. The third patch is in Mr. Peralta's garden and consists of 200 or 300 plants of Egyptian cotton. Wherever the plants were shaded by trees they were badly infested by the *Phytoptus* mentioned before but otherwise there was no insect upon them. Here are also 4 little trees called by Mr. Peralta "Cultivated wild cotton" a form of cotton strangely intermediate between the Sea Island cotton and our short-stapled cotton, the bolls being rather large but the seeds being for three-fourths smooth and pubescent at the basal fourth.

As to the *Anthonomus* the inferences of this visit near Habana are 1) The picudo is either absent in the Province Habana; 2) Or it does not occur at this dry season. 3) It does not affect the Sea Island Cotton.

Just in front of my room here at La Magdalena, Mr. Ferrer has early last December planted what he calls the "Kidney Cotton" and which is the wild cotton of this province. The tree is now more than 6 feet high and bears profusely. The arrangement of the seeds within the bolls is radically different from that of any other variety of cotton known to me.

Please address me until further notice c/o Mr. Eduardo Ferrer etc.

Yours sincerely,

E. A. SCHWARZ

La Magdalena,
Cayamas, Cuba.

February 24, 1903

Dear Dr. Howard,

Rain! Rain! Rain! They all tell me that we are now in the midst of the dry season but so far it has rained here every day since my arrival, and I find that the only difference consists in the fact that in the dry season it rains seven days each week, and in the wet season every day each week. However, it is to be hoped that we have only a moderately wet spell. As matters stand I have thus far but little seen and, entomologically, nothing of importance, but at any rate I am getting a little acquainted

with these strange surroundings and with the conditions under which cultivation is carried on in this remote corner of Cuba.

Last Saturday I had my first experience in looking over a Cuban plantation. Unfortunately Mr. Ferrer insisted that it was "impossible" for an American to go afoot in this country, and so, in spite of my protests, they put me on a mule and off we went. As a result I did not see anything of entomological interest as I did not dare to dismount. We went down to the infested cotton field. As Mr. Ferrer has no doubt written to you, he has cut down by far the larger portion of the field and only a small corner, with less than 100 of the tree-like plants remain. In the meantime each of the cut-down plants have come up again to a height of about two feet, arising from the old roots in a multitude of separate stems. The whole field is difficult to find on account of the multitude of tall, shrub-like weeds which overrun here in a remarkably short time every cultivated spot except the banana plantations. Then we went to the second, not-infested cotton field, about $1\frac{1}{2}$ miles distant from the former. Here the Egyptian cotton plants (which are more tree-like than any other cultivated cotton I ever saw) are still standing but so deeply buried into the tall weeds that I would never have been able to find the field myself. I think the simplest explanation of the immunity of this field is that the weevils have not yet found the field. There is, however, a marked difference in the nature of the soil, in the surroundings themselves and in the character of the vegetation.

In the afternoon (i.e. after breakfast) I insisted on going out afoot. So I went along in the search of the infested field. On my way I saw many specimens of a pink-colored Hibiscus, apparently a Cuban plant and which from the structure of the buds and fruits may possibly be the native food-plant of the *Anthonomus*, although I did not see any trace of it. A heavy rain-storm came up presently and cut short my excursion. I had of course used my beating net on the grasses (now mostly dead) and other low vegetation and saw myself that in spite of the warm weather insect life is, for the most part, dormant at this season, as but few species are about, and few specimens can now be found. A few species of Butterflies, all N.A. species, are

about, a few dragon flies, a big Anthrax, lots of Honey bees (the only larger Hymenopter besides a Sphex), a fine Coccinellid, quite new to me, *Coccinella sanguinea* and a few other small Coleoptera, a few small and common looking Heteroptera and Homoptera. No Orthoptera to be seen except the very young larvae of some crickets.

In the evening I had of course to listen to the story of the hormiga brava (the burning ant) and the hormiga loca (the crazy ant) about which Mr. Ferrer has written to you. He feels a little vexed at the short and—to him—unsatisfactory answer he received from you on this subject which as I have now found out is firmly believed in by everyone in this section of the Island. So on Sunday morning the entire population of La Magdalena turned out and we had soon found a colony of the hormiga brava (*Solenopsis geminata*) and hormiga loca (a common house ant the name of which I have forgotten but it occurs also at Washington, D. C.). The connection of the latter ant with the *Atta* (which is here by far the most injurious insect) remains a mystery to me but is no doubt also a superstition.

After this experience Mr. Ferrer and myself *walked* out in search of one (of) the species of wild cotton growing hereabout (from which I took home a tin box full of infested buds in order to raise parasites); and the group of wild cotton (kidney cotton) is about 400 yards distant hidden by tall shrubbery and grass and quite difficult to find. There is certainly not a single weevil on these plants, which are covered with buds, squares, young and mature bolls, and there is no indication that there were any weevils on them during the past months. On our way home we found another wild *Malvaceous* plant, apparently a *Malvastrum* but both the buds and the fruits are too small to harbour the *Anthonomus*. After breakfast a big rainstorm set in and lasted several hours after which I had only to investigate the hardwood logs which Mr. Ferrer had cut last fall and under the back of which I found a lot of fine insects. In the evening some Noctuids etc. came to light, every species being entirely new to me.

Monday (Feb. 23rd) morning there was a drizzling rain but I went out and visited the only piece of original forest remaining

in the nearest vicinity of this settlement. It was my first visit to a tropical forest and every tree and vine is new to me. The undergrowth is awfully thick and full of spiny vines. The interior hardly harbours any *Malvaceous* plants but there may be some on the more open edges. There is no possibility of using the beating net in this jungle and by working with my umbrella under great difficulty because everything was dripping wet, I found that on the living vegetation there is no insect fauna at this season but that quite a variety of insects, mostly Coleoptera, is to be found on the dead vines and branches, most of the species being small or very small and brand new to me. The rain became heavier and heavier so that I came home thoroughly wet. In the afternoon it rained 1.25 inches (dry season!)

On Tuesday the roads were without any bottom but the rain had stopped and I went out to look at that wild Hibiscus plant. I failed to find the *Anthonomus* but after prolonged searching I found two "bolls" which some time previously had been punctured by something which must have the greatest resemblance to an *Anthonomus*. A little viscid fluid exuded from the wound and upon carefully cutting open the fruit it was to be seen that the insect had fed on the young seeds nearest to the wound. There was certainly no larva within the fruits.

After breakfast I continued my circuit around the hammock mentioned above but did not see any *Malvaceous* plant. Here I saw however the first genuine Cuban butterflies and tore my butterfly net in the effort to get what appeared to me the rarest of them. Again I got a large number of strange Coleoptera from the dead vines, but the absence of any Chalcids or any other Microhymenoptera is very strange. A scorpion under loose bark was altogether too big for any of my collecting vials. Spiders are also very few in numbers and by no means conspicuous either in size, color or shape. A heavy rain shower wetted me again and drove me home.

My health is excellent but one must get accustomed to this sultry weather; everything is and remains damp and my cotton buds which I collected day before yesterday and which I kept in an open glass jar are covered with mould.

Mr. Ferrer sends his regards to you. He and Mrs. Ferrer treat me most kindly and do all they can to make me feel at home in this strange corner of the world. The rest of the inhabitants of this settlement gradually get accustomed to my strange doings and commence to bring insects to me.

Yours sincerely,

E. A. SCHWARZ

La Magdalena,

Cayamas, Cuba.

February 28th, 1903.

Dear Dr. Howard,

The solution of the question as to the original food plant of *Anthonomus grandis* in this section of Cuba proved to be an extremely simple one. Of course it is possible that the *A.* has here more than one original food-plant but my investigations of the past few days only showed a single wild-growing food-plant viz. the wild *Gossypium* of eastern Cuba, popularly called the Kidney Cotton, a rare plant which grows singly or in little groupes in the shrubbery on, or near to, the open savannahs. During the first days of my stay here I trusted to Mr. Ferrer's statement that the *A.* was never to be found on this plant and did not pay sufficient attention to it. The reasons why Mr. Ferrer (who is quite familiar with the weevil and its working on cultivated cotton) overlooked the *A.* on the Kidney cotton are very plain: 1) the plant is not common and grows usually in places not readily accessible to a person riding on horseback; 2) the weevil does by no means occur on every plant or every group of plants; 3) the weevils are much rarer on the Kidney cotton than on cultivated cotton; 4) the effects of the work of the weevil on the Kidney cotton are infinitely less visible than on cultivated cotton, i.e. a square or bud infested by the larva does not show the least outward sign of the infestation and an infested boll looks exactly like a healthy one; 5) owing to the tall and dense grasses and weeds in which the plants grow it is quite impracticable to find fallen squares or bolls on the ground; moreover, as far as I can see the falling of infested squares is an exception rather than the rule.

Otherwise the working of the *A.* on Kidney cotton does not differ from that on cultivated plants: I found bolls containing 4 or 5 larvae, others with only one or two, in the squares or buds there is only one larva; punctured (for feeding purpose) squares occur but no punctured bolls. I must say, however, that we are here in the midst of the dry season where the growth of all wild plants is practically brought to a standstill and only plants under irrigation make progress, so that it is to be assumed that during the rainy season the weevils are more common on the kidney cotton.

This kidney cotton is manifestly either the native species of *Gossypium* here or it has been brought by the Indians from Central America to Cuba long before the arrival of the Spaniards. Its fiber is inferior in quality to the semi-wild "Loose" or "Silken" cotton; the "*Algodon sylvestre*" of western Cuba but some use is made of it by the natives who know the location of every plant in their own neighborhood. Occasionally one or two trees of the kidney cotton is planted in the yards of a Cuban family, but the Loose cotton is by far preferred as a semi-cultivated tree near the houses.

All my efforts to find any trace of the *A.* on this Loose Cotton or on any species of *Malvastrum* or *Hibiscus* have hitherto failed.

The roads near this settlement being impassable the past week until yesterday I begged Mr. Ferrer to visit the second Egyptian cotton field day before yesterday and found the *A.* in full force. A month ago, Mr. Ferrer is positive there was not a single weevil on the field. In addition there is *Dysdercus suturellus* at work on the seeds of the comparatively few open bolls.

The weather seems to have cleared up and it is very warm now, which, however, does not prevent me from taking long excursions. It is only the queer way of taking the daily meals that prevents me from being in the field the whole day.

Sincerely,

E. A. SCHWARZ

La Magdalena, Cayamas, Santa Clara, Cuba. March 10th, 1903
Dear Mr. Fall,

Your welcome letter of February 9th has been forwarded to me to Cuba and reached me only yesterday. Of course I should

have written to you before leaving Washington but in my usual way neglected it. Meanwhile I hope that the Ptinidae and Zygopini of the National Museum have reached you in good condition. The type of the genus *Copturus* is not at the Nat. Museum but I have added to the lot sent to you a species from South America which belongs to the group containing Schönherr's type of the genus. Casey is manifestly right in separating our N. A. species from the typical *Copturus*; in fact Schönherr has placed them in a separate group.

What *Catorama tabaci* Guér. is I do not know and I am unable to send it to you. In former editions of the European Check List it was placed as a questioned synonym of the common *Lasioderma serricorne*.

Among the Ptinidae sent to you you will find a specimen of the Chilian *Trigonogenius globulum* Sol. to prove its identity with LeConte's *Tr. faretus*. You will also find specimens of a new *Hedobia* which was originally imported with wooden frame work from Japan to Washington. It continued to be destructive in the National Museum for several years until we exterminated it with liberal applications of bisulphide of carbon. Recently, however, Mr. Pratt has found two specimens near Alexandria, Va., and the species deserves at least to be mentioned in your Monograph.

Ptinidae from Mexico and the West Indies are mighty scarce in our collection but as soon as I return to Washington (which will be the case within 3 or 4 weeks) I shall send you at once what we have. Here in Cuba I am greatly disappointed regarding the richness of the Ptinid fauna. Not very far from the plantation where I reside for the time being there is a piece of original timber land which if it were in Florida would swarm with Ptinidae, especially the genus *Hemiptychus* but it seems that these beetles do not occur here and I got only two specimens of a *Ptinus* (*sensu latiore*), a *Petalicen* (1 specimen), a thing near *Caenocara* (one specimen), and a big thing with all antennal joints triangular (one specimen). We are, however, here now in the midst of the dry season when insect life is more or less dormant in spite of the high temperature.

As to your list of Desiderata I have commenced with the beginning of it, and what I have accomplished thus far has been

sent to you. As soon as I return to Washington I shall continue this work and try my best to accommodate you with the *Laehnosterias*. A list of the Museum desiderata (as far as I have brought the N.A. material together) has been sent to you, and I shall take the liberty of sending the continuations from time to time. A standing desideratum of the Museum is the genus *Chaetophloeus*.

I am here in the midst of Cuba investigating the Mexican Cotton boll weevil and do a little general collecting in spare hours. No large Buprestids, Cerambycids etc. are to be (had) at this season but the number of undescribed small things one can find here in the course of a few hours is considerable. Cayamas is about 40 miles west of Cienfuegos and lies in the very midst of the sugar cane district of the island.

Yours sincerely

E. A. SCHWARZ

La Magdalena,
Cayamas,
Santa Clara, Cuba.
March 10, 1903.

Dear Dr. Howard,

Since we found out that the wild cotton plants are the food-plants of *Anth. grandis*, Mr. Ferrer (who has taken courage at my going afoot through the country with impunity and is now walking also) and myself have visited and examined every group and every solitary cotton tree within walking distance (from 1 to 3 miles) from the "batei." Furthermore I have engaged a Cuban, one of Mr. Ferrer's men and who knows every cotton tree for many miles around, and under Mr. Ferrer's instructions this man makes now a circuit around La Magdalena at a radius of not less than 6 or 7 miles and collects samples of squares or bolls of every cotton tree he finds. At first he naturally brought along the finest and best-looking samples but he gradually improved and is now able to distinguish the infested squares or bolls from the healthy ones and also knows now how to find the weevils. Finally Dr. O. J. Smith (a genuine Cuban gentleman and not to be confounded with any member of the great Ameri-

can tribe of that name) has taken great interest in this matter and also sends samples of weevils and infested squares and bolls from his residence, Natalia, which is about 7 miles southeast of here.

The result of all this is 1) that this entire section of Santa Clara Province is naturally more or less infested by *Anthonomus*; 2) that the weevils have not spread from Mr. Ferrer's cultivated cotton to the wild plants, but from the latter to the former; 3) that the weevils are more numerous on the Kidney cotton than on the Loose (*Seminella*) cotton, the latter when growing alone usually free of weevils but liable to be infested when growing among or near to the Kidney cotton; 4) Solitary plants or small groups of Kidney cotton are also occasionally, and solitary Kidney plants often, not infested 5) A larger number of wild cotton trees either planted near the houses or growing entirely wild are always infested and here the weevils are more numerous but never as numerous as on the cultivated Egyptian cotton. The largest number of Kidney cotton I saw growing perfectly wild numbered about 50 plants (some of them certainly more than 20 years old) and here I estimated that about 1 out of 20 squares (no green bolls to be seen at this season) was either punctured or contained larvae or pupae of the *A.*; 6) the existence of the cotton weevil in Cuba was entirely unknown until my arrival not only to the Cuban planter but also to the peasants and workmen. The circumstances under which Dr. Gundlach found his specimens seem to be not recorded, or the records have been lost.

Ever since we found the *A.* on the "Loose" cotton I have given up all hope that there exists a cultivated species of *Gossypium* which is immune from the attacks of the *A.* Mr. Ferrer thinks that *every* plant of wild cotton can be exterminated on this island with comparatively little expense but I hardly think that this is possible. At any rate it is absolutely certain that under the present circumstances cotton cultivation in this section of the Island is simply impossible in the absence of any direct remedy against the *A.*

The great desideratum is to ascertain the distribution of the *A.* in Cuba but to accomplish this it is absolutely necessary to master the Spanish language fluently (my own Spanish makes

upon the peasants here much less impression than your French upon the Parisians) and to be able to ride on horseback, and finally to sleep in the huts of the natives and to partake of their food (yams fried in lard). To the latter point I would be able to conform but being deficient in the others, somebody else has to do the work. All I can do is to return to the more civilized western parts of the island where they have roads and hotels and where I have been promised to have carriages and guides.

There is in Cuba an American Daily newspaper, the *Havana Post* which every week brings out big articles as to the possibility of Cuba as a cotton producing country. It appears to me that these articles are all written in the interest of some land-grabbing companies which flourish in Habana. They are of course written without any knowledge of the existence of the A. in this country.

The rains which I encountered here during the first week of my stay have now stopped (save an occasional little shower) and the dry season is now upon us in earnest. The development of the Egyptian cotton and of the A. are at a complete standstill, and I am even unable to get a good supply of infested squares in order to breed parasites. I have in my room two sacks-full of infested squares which I manage to protect from moulding, but not a single parasite has as yet made its appearance.

My collection of Coleoptera makes good progress in spite of the dry season and in spite of the fact that I have to learn a great deal as to the mode of occurrence of nearly all insects. The absence of Lepidopt. larvae is very striking: in fact besides a few common looking Geometrid (excuse this antiquated term) larvae I see only a few Lycaenid larvae, two or three cut-worms in the vegetable gardens, those living in "rotten" cotton bolls (identical with the American species), and a very queer species (a Noctuid?) which destroys Mr. Ferrer's Cuban lilies (I hope to breed this). Still more striking is the absence of Micro-Hymenoptera, and among the few, that can be met with by sweeping or beating, none or hardly any are of unusual form. Mosquitoes are common here. During the first, rainy, week I spent here a ring-legged *Culex* was common in my room biting both during day

and night. It has now entirely disappeared to make room for another dark-colored species which is probably identical with one which is common in the woods and which is especially bad in the early evening hours. A third species which is extremely troublesome in the woods during day time never comes to the house. I do not remember having seen this species near Washington.

I suppose that Mr. F. has informed you that during the war his plantation was thoroughly destroyed several times by both the Spaniards and the insurgents. All his valuable fruit trees have been cut down and burned so that now there is but little chance for collecting scale insects. His orange trees harbor as far as I can see, only one species; on his Alligator pears I found two solitary specimens of a *Ceroplastes*. His cotton trees (which were not burned) are white with a common-looking scale, and on his improved Guavas there is occasionally a scale which, however, is infinitely more common on the wild Guavas growing on the savannahs. The Hibiscus mentioned by me at a former occasion is also occasionally covered with a white scale.

Mr. F. tells me that in order to see something of the Cuban insects it is necessary to wait until the beginning of the rainy season. This of course I cannot do and, in fact, I have made up my mind to leave here next Saturday or Sunday to return to Habana *via* Matanzas. The hospitality and kindness with which I am treated here by both Mr. and Mrs. Ferrer I am unable to put into words, but I feel that I should not longer impose upon them. Everyone else of educated people I meet with, treat me also most friendly and even persons quite unknown to me show signs of hospitality. Thus, I received the other day from the Mayor of Cardenas (the emporium for this section of the Island) a box of the finest Cuban cigars.

I have your two letters of March 3rd. They were very welcome to me though to tell the truth they were extremely short. If you and Mr. Marlatt want to get rid of your grip quickly you should come to this beautiful country of eternal summer where even in the month of February the younger generation of humanity goes about in *plenis naturalibus*.

My health is excellent: my neck and arms are of course burned frightfully by the sun and in spite of the dry season the numer-

ous scratches one gets here from the many spiny plants refuse to heal.

Yours sincerely,

E. A. SCHWARZ

P. S. My address until further notice will be Habana, General P.O. delivery but do not write me unless it be necessary, for my plans for the next two weeks are not yet matured.

La Magdalena,
Cayamas, Cuba.

March 18th, 1903

Dear Dr. Howard,

Since I wrote you my last letter I have been running about in the woods, in the prairies, along the edges of the cane fields, using vigorously my beating net, my umbrella and in fact every collecting method known to me. My general collection has thus considerably increased but I have never seen any specimens of *Anthonomus grandis* upon any other plant besides *Gossypium*. There is not the slightest doubt in my opinion that the original and only food-plants of the weevil are the varieties of *Gossypium* and here in Cuba the variety known as Kidney Cotton.

The temperature has risen considerably during my stay at Cayamas but it is now terribly dry so that very little development in plant and insect life takes place. The cotton plants do not produce any new buds or squares and I have great trouble in finding a dozen, or so, fallen squares to place them in my breeding bags. I have hitherto bred more than 100 specimens of *Anth. grandis* but not a single parasite!

Mr. Ferrer has been the other day in Habana and greatly alarmed the resident enthusiasts in and advocates of cotton culture in Cuba by his account of the condition of affairs in Santa Clara province. I am now on the point of returning to Habana and greatly wonder what I shall be able to find there of the weevil. I have been promised every assistance from several interested parties, and since there are wagon roads in the provinces of Habana and Pinar del Rio I may be able to move about somewhat. Here, in Santa Clara, there is not a single wagon road and since the country is extremely thinly settled I am unable to

undertake larger excursions. The man whom I had hired has within 15 days made the circuit around La Magdalena at a radius of from 5 to 8 miles (expense \$30 U. S. curr'y) and brought samples of cotton from more than 80 localities (every isolated hut has here a name). The result is the establishment of the fact that the weevils are to be found in every direction just as in the immediate vicinity of La Magdalena. The "Loose" cotton is usually, but not always, free from the attacks of the weevil and just of this variety the man has brought a few samples of a magnificent variety which is manifestly of considerable commercial importance. Mr. Ferrer intends to plant half an acre or so of this cotton in the immediate vicinity of his infested Egyptian cotton in order to test whether or not this cotton will retain its relative immunity even in presence of a multitude of the weevils.

I intend to leave here tomorrow morning at 2 o'clock. (the only train on the Cardenas road leaves Campiña, the nearest railroad station, at 3:30 a.m.) and to lay over for a day or two at Matanzas where I probably shall not see much of wild cotton plants. Until further notice, letters will reach me at Habana, General P. O. delivery.

I hope that you have recovered from your grip; if not come to Cayamas where the temperature to-day at noon was 87° (with plenty of mosquitoes!). My health is excellent but of course the sun has burned me considerably and my arms and legs are covered with scratches and sores. I met, however, with an annoying misfortune in breaking the spring of my watch which until then was the only reliable time piece existing in this plantation.

Yours sincerely,

E. A. SCHWARZ

Cayamas, Cuba, Dec. 19, 1903

Dear Dr. Howard,

Mr. Ferrer and myself arrived here safely yesterday night after 14 hours' traveling from Havana *via* Matanzas and Cardenas. After driving out a portion of the bats, rats and frogs I occupied my old room which, however, is this time, in the absence of Mrs. Ferrer, not so conveniently made up as on my first visit.

During the night we had a severe cold wave from the north and at 6 o'cl. this morning the temperature was as low as 41° . At 7 o'cl. Mr. Ferrer, his overseer, who takes a great deal of interest in the Picudo matter (he speaks a kind of Spanish of which I fail to understand a single word) and myself started out on a long inspection tour, and in the afternoon (when the temperature rose again to 81°) I continued the same. The result is that owing to fires and cutting down of many cotton plants, the material for experimentation is greatly lessened since my first visit. The country is also much dryer than I ever saw it before; all plants including cotton have been on a standstill since many weeks, and weevils are scarce. We shall have to resort to irrigation to make the plants produce squares which of course will sufficiently increase the number of the weevils. The "Lion ants" were nearly frozen to death this morning and even refused to attack the weevils thrown into their nests.

I shall not commence to-day writing about what I saw and leave that for you to read after your return from St. Louis.

Wishing you a merry and healthy Xmas,

I remain

Yours sincerely,

E. A. SCHWARZ

Cayamas, Cuba, December 19, 1903

Dear Herbert,

I have safely arrived here in company of Mr. Ferrer whom I met at Havana at the appointed place and hour. We traveled by way of Matanzas and Cardenas thence southward by rail to Campiña. Thence a ride of two hours in total darkness on a very primitive road to Cayamas. Only a Cuban volanta is able to pass over such road in safety. Nevertheless I found one of my chloroform vials broken in my valise. During my first night in Cayamas a norther came down from the U. S., and at 6 o'cl. this evening the thermometer was at 41° . Since there are no overcoats, ovens and other appliances to produce heat at Cayamas we suffered severely and had to walk 3 miles before breakfast to keep warm. In the afternoon I started out again but this time I perspired like a pig, the temperature having risen to 84° and

butterflies, bees etc. were flying about. The cotton boll weevil (*Anthonomus grandis*) is still about and in some places quite common. Accidentally I captured a fine Cerambycid (Lamiid) new to our collection but of a genus not known to me.

Please send me, under frank of Dept. of Agriculture, some of those small envelopes for preserving Neuroptera and Rhopalocera (forty or fifty will suffice), and also some Cayamas labels, about 300.

My health is first rate and I hope soon to get rid of my rheumatism.

I hope you are in good health and wish you a merry and profitable Xmas.

Yours sincerely,

E. A. SCHWARZ

Cayamas, Cuba, Feb. 20, 1904

Dear Herbert,

It is too bad that I neglected so long to write to you and to thank you for your nice Christmas present and for your kindness in sending *Science* to me. It is not easy to write from here: during the day the strong breeze blows through my room so that it is next to impossible to sit down and to do some work. In the early morning hours when there is no breeze everything is wet including the writing paper and in the evening I have only the dim light of an acetylene light high above my table so that I cannot see anything.

In the cotton boll weevil matter there is no use for my staying and I shall return to Washington by the end of next week. I hope to find warm weather there because we had lately here some pretty cold weather, the temperature not reaching 75° and sinking as low as 50° which is not very pleasant.

There has not been any rainfall in this section of Cuba since October last. Everything is dried up and insects are much scarcer this year than they were during my first stay. I have collected hardly anything in the line of Lepidoptera, Diptera, Neuroptera, etc; I had to "concentrate" myself to one order but by doing so and by hard work I have brought together a very valuable collection of Coleoptera containing more than 100 species which I did not find last year. Last year there were some

big fires on this plantation and during the past month we had three other big fires so the country is black and bare of vegetation for a couple of miles around. So I have to walk long distances to get to a place where a little collecting can be done. Fortunately Mr. Ferrer girdled last summer most of the big Ceiba trees all over his plantation and I also had the luck of finding two of these big trees fallen to the ground and which were in the proper condition and in and on these trees any number of Coleoptera can be found. It is strange, however, that this remarkable tree does not possess a peculiar Scolytid but only *Xyleborus* and *Hypothenemus* which infest all sorts of trees. Many other good things were found by me in the two species of palmetto (*Chamaeropa*) that occur here besides the Royal Palm. Again I failed to get a collection of aquatic species except one or two little *Bidessus* and a species of *Bagous* which is able to swim as fast as any Dytiscid.

The cotton plants furnished this year quite a number of species which I did not see last year. This is probably due to the extremely dry weather, the cotton tree being, besides the sugar cane, about the only plant which has not suffered from the drouth and which attracts various interesting things.

Collecting at night did not furnish anything new this time and the few moths and beetles that came were not new to me.

Please stop sending Science to me.

I expect to return here in May and leave here part of my entomological outfit.

The other day Mr. Ferrer and myself went over to Cardenas where in one of the Public Schools they got a couple of boxes with some broken and *Dermestes*-eaten entomolog. specimens. Among the Lepidoptera there are a few fine Sphingidae and among the Coleoptera a lot of Curculionidae which I do not see around Cayamas but which no doubt are about during the rainy season. At Cardenas I also tried to get to the sea-coast but owing to the unfavorable strong wind we gave up the attempt after a couple of hours sailing in a very rough sea.

Hoping to see you and everyone else in the Office in good health, I remain

Yours faithfully,

E. A. SCHWARZ

La Magdalena, Cayamas, Cuba

May 10th, 1904

Dear Dr. Marlatt,

I arrived here all right last Thursday night and was again most hospitably received by Mr. Ferrer. The rainy season is in full sway here and my stay will be by far more interesting than pleasant. A heavy shower pours down twice or three times a day and the country resembles more a lake than terra firma. But everything swarming now with insects including mosquitoes, Hippelates, Homoloryia, kissing bugs etc. In spite of Mr. Ferrer's ants (*Dorymymex*) and the Cuban oriole the cotton crop is sure to be entirely eaten up by the weevil within the next three or four weeks but just on account of this fact I have now, after weeks and weeks of talking, convinced Mr. Ferrer that cotton can be successfully grown in Cuba in spite of the weevil. He is just now planting some 30 acres of cotton of various varieties.

Last Friday I ran out from Havana to Santiago de Las Vegas but Prof. Earle was unfortunately not at home. I sniffed, however, around for an hour at the Agricult. Exper. Station. Everything is of course new, and there is practically no Agric. Exp. St. in existence yet but only the old Orphan Asylum where the boys among other things were taught a little practical agriculture. The houses for the future members of the Station are rather small but inhabitable though they are not exactly what in the United States we would call a house. There are, however, many things, including houses, in Cuba which on account of the tropical climate must be made different from what we are accustomed in the States. The climate is, however, at this season a severe one, and should Mr. Kotinsky accept the position I would strongly urge him *not* to bring his family over before the end of October. Santiago is very beautifully situated, the surrounding country being a continuous orchard, although there is, besides the old Agr. College, not a single good house in the old town. It is quite close to Havana and there are three trains daily.

Mr. Ferrer is anxious to make the acquaintance of Prof. Earle and we have planned to go to Santiago by the end of this week

for a day or two. I shall then be able to report more fully about the place.

Hoping that all is well in Washington in general and at the Department in particular, I remain

Yours sincerely

E. A. SCHWARZ

La Magdalena,
Cayamas, Cuba, May 18th, 1904

Dear Mr. Marlatt,

It has been raining here continuously for the past 48 hours so that everything outdoors and indoors, including my regular writing paper, is either wet or damp.

In company of Mr. Ferrer I have again visited the Agricult. Experiment Station at Santiago de Las Vegas where we were hospitably received by Mr. and Mrs. Earle. Prof. Earle told me that the negotiations with Kotinsky have been discontinued since no agreement could be reached. So it is useless for the present to write further on the subject but if I can find the time will let you know what I saw at the Station. I merely mention that Mr. Carl F. Baker will be the Entomologist of the Station, and Mr. M. T. Cook of Indiana, the Botanist. I was informed by Prof. Earle that the latter is "the best authority on Galls and Gall insects" to which I did not make any reply.

I am much obliged for your letter of May 10th and for your efforts to get me a supply of *Chilocorus*. The few Orange trees at Mr. Ferrer's place and all the Orange trees at Mr. Earle's Station are in a bad shape. All the Florida Scales are here and there is an almost complete absence of Coccid feeding Coccinellidae. In fact the only species to be seen on the Orange trees is *Chilocorus cacti* and this is, for reasons unknown to me, quite rare. Coccinellids feeding on *Lecanium* are more plentiful here (I have 3 genera) while species feeding on *Dactylopius* and Aphids abound in species though with few exceptions not in specimens.

Besides Scale Insects, Mr. Earle has on his orange trees an abundance of Aleurodes which do not occur at Cayamas.

What I write more particularly about is to beg you to have me sent as soon as convenient 4 or 5 10c bottles of Oil of Citronella

which appears to be THE remedy for the Cuban mosquitoes. The latter abound of course now almost every where in Cuba: here, in the house at Cayamas, *Stegomyia* is the most abundant species while *Culex pipiens* is now more abundant in the fields than in the houses. No place in Cuba seems, however, more infested by mosquitoes (species unknown to me) than Cardenas where I spent a night last week. It seems hardly possible that people can live in that place. Now, I had a small vial of Citronella with me and while seated at the dinner table with Mr. Ferrer and his friends—everyone of us surrounded by a cloud of mosquitoes—I gave an exhibition of the power of Citronella. In less than a second there was not a single mosquito to be seen in the room. Thereupon was great astonishment and excitement among the inhabitants of Cardenas—in fact the greatest excitement since the blowing up of the Maine. I have distributed all the Citronella oil I have here and there are many more people that are clamoring for it.

A small bottle of this oil costs in Washington 10c so please buy for me 4 or 5 bottles (I shall refund you this money upon my return) and send them to me or better, addressed to Señor Eduardo Ferrer, Cayamas, Cuba, under official frank. I suppose the oil can be obtained in almost every drug store; the bottle I have was bought by Mr. Barber at Chas. J. Fuhrmann, Cor. 8th and East Capitol Sts., Washington, D. C.

As to myself I can stand the mosquitoes although I must confess that, should they get a little thicker, I would like a little of the oil for myself.

While at Habana I secured finally after much effort a copy of Gundlach's Ornithology of Cuba, from which I see that Mr. Ferrer's Solibio has been erroneously named by the Division of Biology. It is the *Xanthornus hypomelas* Bonap., family Icteridae. I have seen it with my own eyes that this bird opens cotton squares and bolls in search of larvae, pupae et imagoes of the Cotton boll weevil. It may be that one or two of the Cuban Blackbirds have similar habits.

Yours sincerely,

E. A. SCHWARZ

La Magdalena, Cayamas, Cuba.

May 21, 1904

Dear Herbert,

I was greatly pleased to get your letter of the 12th in this lonely place.—The cotton boll weevil is by no means injurious to the cotton plant; in fact the more weevils the better look the plants. They only destroy what man finds useful in the plant, viz. the bolls and their earlier stages, viz. the squares and the blossoms. Of course very little can be done in a few weeks stay at a place, since the natural history of the beetle is now well known. Try to ascertain whether the weevils are equally common on all fields you can visit; or if they are more abundant on one field than on another, try to ascertain the cause; for instance cleanliness in cultivation; whether old or new (i.e. planted this year); low ground or high ground, etc.—The number of weevils can best be ascertained by the number of infested (by the larva) squares you find on the ground beneath the plants.—Try and raise parasites of the weevil; this can be readily done by simply collecting the fallen squares (those containing the more full-grown larvae are more or less wilted and can be easily recognized with a little practice) and putting them in sacs (not in boxes) and occasionally moistening them. After from two to three weeks some hymenopt. parasites should make their appearance. Such sacks of infested squares after the latter have become sufficiently dry to protect them from getting mouldy can eventually be sent to Washington where the parasites, if there be any, could be bred.

Try to find out whether there is now either near Brownsville or Matamoras a cotton gin, or, if not, where the cotton is sent to for ginning, and how it is shipped.

Make a collection of all insects, or at least of all Coleoptera to be found on cotton plants.—Try and make collections of all insects that live on plants allied to cotton (Malvaceous plants).

They have here at Cayamas a small bird, the Solibio, (*Xanthornus hyponselus*) which visits the cotton fields in flocks, and digs out the weevils or their larvae from the infested squares lying on the ground, or from the infested bolls on the plants. If you have luck you may possibly observe with your good eyes some

bird in the Brownsville region that has similar habits. This is, however, a very remote possibility.

Yours sincerely,

E. A. SCHWARZ

P. S. Do not fail to write to Dr. Howard before returning to Victoria, stating that on June 15th or thereabout you would be at that place awaiting further instructions from him. E. A. S.

Cayamas, May 21st, 1904

Dear Herbert,

I have written the first two pages of this letter separately so that eventually you may show them to Dr. Howard.

Now I see from your very interesting letter that you are doing good work. Of course there is not a single locality in the world where good species can be found without hard work and I only hope that you will not overwork yourself so as to injure your health.

I have very little knowledge of the Brownsville region; in fact all my experience there was acquired on two short visits to San Tomas which is about 8 miles down the river and which appeared to me then an admirable locality, and I hope you will visit the place at least for one day.

There is nothing to collect on Padre Island; all the good things (*Pogonus texanus* and *Throscinus*) have been found on the shore of the mainland.

The mounting of a sample collection while in the field has been urged by many entomologists, f.i. by Mr. Bates, the famous explorer of the Amazons. The only objections I have are 1) that it takes considerable time; 2) that it increases the bulk of the baggage. In your case you can of course ship boxes with pinned material from Victoria to Washington or mail other boxes from Brownsville.

If you can get along with Armstrong—all right, but be a little careful. I understand from Mr. Schaeffer that Armstrong occasionally gets on a spree when it is difficult to manage him.

Fleas are extremely bad at Habana and Cardenas but for some reason unknown to me are nearly absent at Cayamas although there are dogs and cats in the house. *Stegomyia* is now the com-

monest house mosquito here and bites me much more frequently during day time than *Culex pipiens*.

If I am not mistaken I have published somewhere the Mexican story of the "camponucha." This superstition has spread from Mexico to Illinois and Missouri.—I am afraid that your small Byrrhid from the mud cracks is nothing but the common *Limnichus lutrochinus*, a species common all over Texas.

Some 10 years ago I learned at Brownsville that the railroad was only about 10 miles away from Br. and now you write that it is 25 miles away. I am afraid that you will have to wait another 10 years before it gets anywhere near B.

I have no other suggestions to make to you except that you should be careful about your health. If you see young palmetto trees with half-dead leaves within reach do not fail to beat them heavily with your stick. A large yellowish Anthribid and a small black beetle of unknown position is sure to occur there, and besides various other things are likely to occur.

I have to stop my letter *here* for the rain has just ceased—a thing of very rare occurrence at Cayamas at this season—and I shall make an attempt to wade through the knee-deep slush to the cottonfield. I shall continue the letter, however, before tomorrow.

I expect to return to Washington on or about June 15th.

Yours sincerely,

E. A. SCHWARZ

La Magdalena,

Cayamas, Cuba, May 21st, 1904.

Dear Mr. Marlatt,

I am very much obliged to you for your letter of May 14th and to you as well as to Kotinsky for sending me specimens of *Chilocorus bivulnerus*. The box arrived all right but the specimens were unfortunately all dead! PLEASE try it again. Some ten years ago when Riley and Hubbard were at Montserrat, W. I., Pergande and myself sent the *Chilocorus* and many specimens arrived there alive. The best success was obtained by the following method: A wooden box of the proper size; a number of twigs infested by scale insects nailed or otherwise fastened to the sides

of the box so that they could not rattle about and care being taken that between the twigs and the sides as well the under and upper sides of the box, there is just room enough for the Ladybirds or their larvae to move about.

I think sooner or later Prof. Earle (or his successor) will ask the U. S. Department of Agriculture for scale-feeding Ladybirds; so it would be worth the trouble to gain experience in properly packing them.

If no *Chilocorus* can be obtained I would be glad to try the *Pentilia* (= *Smilia* = *Epismilia* = *Pseudowisea*) *misalla*.

I enclose sample of the scale which at Cayamas makes most of the trouble.

Day before yesterday we had here 6.75 inches of rain; yesterday we had 2.25 inches and to-day we will have about 4 inches. The whole country is under water, and it is quite a feat to walk out to the cottonfield.

I expect to stay here until the first week of June; so if you send Ladybirds send them soon and in several instalments.

Yours sincerely,

E. A. SCHWARZ

Cayamas, Cuba, May 22, 1904

Dear Herbert,

My letter of yesterday was written in the greatest hurry in order to send it off on the same day; for in this season of frequent tremendous showers it happens about twice a week that the Cayamas people are completely isolated from the outer world. Since I am here we had at least one heavy shower each day, but on May 19th it commenced to rain in earnest, and within 12 hours we had 6.75 inches of rain; on May 20th we had 2.12 inches and on May 21st, 3 inches within one hour. Today it is sure to rain again, although at this writing, (6 o'cl. a. m.) the sky is clear.

The entire low region of Santa Clara Province is now more or less under water and wherever there is no water there is bottomless soft red-colored mud. The two creeks in this vicinity which were always dry in winter time are now large streams and the only bridge has been carried away by the floods. As a conse-

quence the field of entomological excursions has become extremely limited and some of my best localities are now beyond my reach. The maximum temperature is only between 80 and 85° but since the air is constantly saturated with water, the heat appears to be quite oppressive. However, I see that I can stand a Cuban summer weather; the question is only how long my shoes, pants, etc., will stand this rough treatment.

As a matter of course there are now a great many species of insects out which I did not see in winter time. In Coleoptera there are various species of the Otorhynchid genera *Exophthalmus* and *Pachnaeus* swarming everywhere, 3 species of *Pyrophorus* fly about at night plentifully and can also be found during daytime; 5 or 6 *Lachnosternas*, one *Cyclocephala*, an *Anomala*, various *Strategus*, etc., etc. swarm at light. In that little bit of timber which I still can visit I find a great many species new to my collection, and on the cotton plants there is another big set of Coleoptera but none of them injurious to the plants. Besides the species mentioned above a great number of things come to light but there are here just as at Washington good evenings and poor evenings without any explanation in sight. I thus got various genera of Carabidae, Dytiscidae, Hydrophilidae and many species of various families new to me.

As a whole I got so many species of Coleoptera that I have not been able to keep track of the number of species I found. In all other orders of insects I am greatly disappointed at the Cuban summer fauna. In Diurnal Lepidoptera I see hardly anything that I did not see in wintertime, and while in the Heterocera there are some big Sphingidae out and the gigantic *Erebus odora* is flying about, all that comes to light is composed of small species of Pyralids, Tortricides, and Tineids, rarely a Noctuid. In Diptera a large number of Cecidomyids come to light but larger species are nearly completely absent. In Hymenoptera and Orthoptera hardly any new forms can be seen. In Neuroptera I see various Dragonflies about, which I did not see in wintertime, but I have not yet caught any of them. In Hemiptera various new forms of various families are now out.

Greatly astonishing is to me the scarcity of flowers but I am told that the season of flowers is at the end of the rainy season in September and October.

The very best thing I found, however is my old $\frac{1}{8}$ inch Tolles lens which was in the proper pocket of my old vest which I had left here. Unfortunately there was nothing drinkable in Cayamas to celebrate this event.

The other day Mr. Ferrer and myself made an expedition to Cardenas. Here, through the kindness of one of Mr. Ferrer's friends I obtained finally a specimen of the genuine Jejen (*Oecactus furens* Poey, allied to *Ceratopogon*) which has been described from that town. Cardenas surrounded as it is by miles of salt marshes is further remarkable from the astonishing number of mosquitoes that infest the town. While sitting at supper with Mr. Ferrer and his friends in the dining room of the hotel everyone of us was surrounded by a cloud of mosquitoes. I had your bottle of Citronella oil along and gave now an exhibition of its power. In less than a second there was not a single mosquito to be seen in the room. This greatly astonished and pleased the Cardenasians, and I had to make a general distribution of the oil.

As I wrote you before I expect to return to Washington not later than June 15th but previous to my leaving Cuba I have to pay a visit to Prof. Earle, of the Agric. Exper. Station at Santiago de las Vegas (near Habana) and hope to get for a couple days to Herredura in the pine region of western Cuba.

Yours sincerely,

E. A. SCHWARZ

Cayamas, Cuba, May 30, 1904

Dear Herbert,

I have your welcome letter of May 20th with enclosure. The Snow party will not do any great damage and will not in any way compete with you; they are only after big things, Lepidoptera and Coleoptera, and none of them understand anything about subtile collecting. That you have to beat the same twigs and branches on which Schaeffer and Doll worked last year is just what you should do. When Mr. Schaeffer was at Washington I was struck very much with the absence of small and subtile things a certain number of which no doubt occurs in the Brownsville region, and I hope you will bring some of them along.

Prof. Snow is a very pleasant old man, but you will not learn much of him regarding modes of collecting, etc. I also made some years ago the acquaintance of Mr. E. S. Tucker who came once to Washington.

My health continues to be in first-class condition but the flood and mud situation is getting worse from day to day. There is rain, real rain, every day and the two creeks have now overflowed their banks and my operations are now constricted to a narrow stripe of semifluid land where there are hardly any collecting facilities. Moreover comparatively little comes now to light since the moon is nearly full. Nevertheless I continue to find every day one or two species new to my Cayamas collection and only this morning I got two species of Cerambycidae, an *Elatерopsis* and a big *Prionid* which I never saw before.

I expect to leave here next Sunday but it will be about the middle of next month before I return to Washington.

Address me at Washington.

Yours sincerely,

E. A. SCHWARZ.

P. S. I forgot to tell you that after you had left for Texas, I had in Washington a short but marked supernatural inspiration—perhaps because I had taken one glass of lager beyond my usual quantum—during which I determined that *Tree-Yucca* larva of yours from *Hesperia*, Cala. It is unquestionably a *Lampyrid* but the genus is no doubt undescribed and has never been found in the imago state.

E. A. S.

Cayamas, Cuba, June 2nd, 1904.

Dear Dr. Howard,

(My regular writing paper got wet again and I have to use this note paper)

I had just commenced to write you a long account of my experience when your two letters of May 25th and May 27th resp. arrived. Leaving for the present everything else I must confess that I am greatly surprised about your plan of sending me right away to Guatemala. Of course I shall stay here at Cayamas until I hear from you in regard to this expedition but I would beg you to take the following into consideration:

First of all I am quite unprepared to undertake this trip on so short a notice being unacquainted with the topography, prevailing customs, mode of traveling, etc. in Guatemala; 2) while my stay at Cayamas during this warm and rainy weather has been greatly beneficial to my health, my shoework and clothing have suffered most severely by a month's tramping through mud, slush and water, so that necessarily I have to refit somewhere. And this cannot be done at Cayamas or anywhere nearby where absolutely nothing can be obtained. 3) I have only funds enough in my pocket to carry me back to the States. 4) Since I promised to be in Washington by the middle of June it would make me some trouble to adjust various private things by mail.

As a whole I am inclined to think that it would make only a difference of 4 or 5 days and not more than \$50 if you would allow me to come to Washington before going to Guatemala.

However, if you insist upon your plan I could arrange all matters in New Orleans and in order to avoid any possible confusion I propose 1) to stay at Cayamas until I get further orders from you, but not later than Saturday, June 11th. It takes six (6) days for a letter from Washington to reach Cayamas if it does not rain heavily.

2) On Sunday, June 12th, telegram will reach me addressed: E. A. Schwarz, Hotel Europa, Cardenas, Cuba.

3) Monday, June 13th to Wednesday June 15th letters and telegrams will reach me addressed: E. A. Schwarz, Hotel Mascotte, Habana, Cuba. A letter mailed in Washington before noon of Saturday June 11th will reach Habana on Tuesday, June 14th and be delivered the same day.

Should I not get any orders from you until June 15th I shall take the Tampa boat on Thursday, June 16th.

Yours sincerely,

E. A. SCHWARZ.

Cayamas, Cuba,
June 4, 1904

Dear Dr. Howard,

Another box said to contain 24 larvae and 3 imagoes of *Chilocorus bivulnerus* has just come, and I am glad to say that, on

account of the correct packing and probably also because larvae were sent—the contents arrived in quite satisfactory condition.

The three imagoes were dead; of living larvae I count 14 and I see further 4 pupae in the box. This leaves 6 larvae unaccounted for, but the pupae are fastened to two sticks in such a way that I do not dare to take out the latter and to see what is beneath them.

All of the 14 living larvae commenced to feed at once upon the Orange Scale and I have liberated them upon one of Mr. Ferrer's orange trees which is badly infested. Whether or not it will be possible to colonize the Ladybird here starting with 14 larvae and 3 pupae—remains to be seen.

A copy of the *Washington Post* of May 28, 1904, containing an abstract of O. F. Cook's remarkable discovery in Guatemala, has just come to hand, and I have shown it to Mr. Ferrer. I abstain from repeating here the comments made by us, principally for the reason that the article in question may contain various inaccuracies and misstatements which are probably not in the Special Bulletin.

Please have a copy of this Bulletin sent to Mr. Ferrer, and I also beg you to have Mr. Ferrer's name placed on the list of those who get all publications of the Division or Bureau. He has not even Hunter's latest Bulletin on the Anthonomus.

The excessive multiplication of the House mosquito that has taken place within the last week or so renders writing extremely difficult, and I am making but slow headway with my report to you. I have a good collection of the mosquitoes of the Cayamas region although on account of the flooded condition of the country I can visit only a small portion of the plantation. I have collected various species which I never saw in the dry season though the mosquito fauna of Cayamas is evidently not very rich in species. Other species may, however, come later in the season. As it is, three (possibly 4) species are present in field and wood in untold myriads. In my room *Stegomyia* was at first by far the commonest species but it has become gradually rarer and a species of *Culex* (I think different from *C. pipiens* which is the house mosquito in the dry season) is now present by the millions.

Yours sincerely

E. A. SCHWARZ

Washington, D. C. November 18th. 1904

Dear Mr. Fall,

I would have responded sooner to your request but I have been absent in Texas for a fortnight and Mrs. Richmond brought me your letter only this morning.

1) I inclose a copy of Baudi's description of *Rhadine* (not in Ann. Mus. Civ. Genova, but in Berl. Ent. Zts. 1873). It is, however, not easy to ascertain whether the genus belongs to Mulsant's Anobiens or to his Dorcatomiens. From the description it belongs to the latter subfamily but Baudi has placed it among the Anobiens. A copy of Mr. Rye's remarks from Zool. Rec. is also inclosed.

2) The name *Eutylistus* is not preoccupied. The name *Tyloma* is also not preoccupied but since we have in Coleoptera *Tylomus* Schönherr and in mammals *Tylomys* Peters, it is not advisable to use the name *Tyloma*.

3) I distinctly remember the mode of occurrence of the Victoria, Texas ? *Caenocara*. It was found in a hard tree-fungus (probably genus *Agaricus*) in company of *Arrhenoplita ferruginea* and *Ennearthron* sp.

4) As to the Brownsville, Tex. species of *Teretriosoma* and *Teretrius* see Mr. Ch. Schaeffer's paper in the next number of Journ. N. Y. Ent. Soc., as soon as this paper is published I shall go over the descriptions. I merely want to say here that the Brownsville *Teretrius* was sent by me to Dr. Horn who answered that it was *not* his *T. levatus*.

5) A few days ago Prof. Fletcher sent to the Dep't of Agricult. a Ptinid from Montreal, Canada, which I at once recognized as *Niptus hololeucus*. It occurred in great numbers in a house at Montreal. Fletcher will probably publish something about this species in the next number of the *Canad. Entomol.*, and you should include it in your monograph.

Could you furnish for the U. S. Nat. Museum duplicate specimens of the *Xylophili* described by you?

Dr Howard has just submitted to me, for examination and report, 600 birds' stomachs from Texas. This thankless and laborious work will occupy me for the next five or six months!!

Yours sincerely,

E. A. SCHWARZ

Washington, D. C. Jan. 23rd, 1905

Dear Mr. Fall,

It is unfortunate that both Mr. Barber and myself are so overwhelmed with routine work that the Brownsville, Tex. Coleoptera are not yet fully mounted. About one-half of the collection is still in pill-boxes, but Mr. Barber, while in the field, mounted one specimen of each species he captured, and this set, as far as the Ptinidae are concerned is herewith sent to you with the other Ptinidae as far as they are mounted. Mr. Barber's collection of Brownsville Coleoptera is an important one, and a full list of all species will be made out. For this reason I beg to keep this *numbered* set apart from the rest of the Museum material.

Did you see Reitter's "Analytische Tabelle" etc. of the European Anobiidae (Byrrhidae) published in 1903?

For the next five or six months I shall not be able to occupy with Coleoptera: there are on my desk 1300 (!) birds' stomachs to be examined for the Cotton boll weevil investigation. During the past three weeks I have examined 250 stomachs—a very tedious and ill-smelling work.

Your desiderata of Brownsville species will be attended to—but when, I am unable to say.

Barber's Ptinidae will be sent to you tomorrow through Dr. L. O. Howard.

Hoping that you are in good health and in the further hope that in this year 1905 we will get your work on the Ptinidae, I remain

Yours sincerely

E. A. SCHWARZ

United States National Museum

Washington, D. C. Febr. 4, 1905

Dear Mr. Blanchard,

I was greatly pleased to get your letter and to learn that after your trying affliction you found courage enough to return to the Coleoptera.

As to your efforts to get specimens of, or information on, *Throscus pugnax* from the Carnegie Museum I would say that Dr. Holland has gone to England as far as I know. So you will

not get any reply from him just now. Moreover it is very difficult to get from him any specimen of any Order for study. The only specimen of *A. pugnax* which I ever found got lost while being sent to Dr. Horn.

I have made out, for my own use, a list of the Coleoptera described from the West Indies. No species of *Throscus* is known from there, and *Th. duvalii* Bonv. comes from southern France. The only species of *Throscus* I found in Cuba is, therefore, most likely undescribed and I send you herewith all my specimens in the hope that you will describe it. Of the 5 species of West Indian *Drapetes* I found three in considerable number of specimens of which I gladly send you some for your own collection.

I also send you the *Throscid* material that has accumulated at the Nat. Museum since last year. The most valuable portion thereof are the few species collected at Brownsville, Tex. by Mr. H. S. Barber.

I also put in the box for you a few specimens of *Throscinus schwarzi* Schäffer, and finally 3 species (for your collection) of which I would like your opinion. They are a *Dasytid* (probably new genus) and a *Colydid* (also n. gen.) from California and an *Anthonomus* from Texas which has lately appeared in enormous numbers on the cultivated pepper plants.

I shall tomorrow attend to your other questions and also to the *Hemicrepidius* but our material in that genus is far from being rich or otherwise valuable.

The box with the *Throscidae* will be sent to you through the Museum authorities. Since there is a little red tape here it will probably take a few days before it reaches you.

yours very sincerely

E. A. SCHWARZ

Washington, D. C., March 2nd. 1905

Dear Mr. Blanchard,

Mr. Barber and myself have examined our *Anillus*: we have only 3 species here, but in two of them, *A. debilis* and *A. fortis*, the tubercle or ocellus can be very plainly seen. In the 3rd species, *A. explanatus* (only one specimen) no trace of it can be seen but this species deviates in several important characters, e.g. the form of the mandibles, from the other two.

Whether the object is an ocellus or merely a black tubercle I shall not decide; under high magnifying power it is seen to be situated *on the front*, *i.e.* some distance from the clypeal suture. Mr. Barber has prepared a fine microscopic slide of this structure which slide is at your disposal if you wish.

I have done some hunting in the literature regarding the spiracles in Dermestid larvae but hitherto without any success but I shall let you know when I strike something. At any rate I send you herewith a perfectly preserved larval skin of Barber's *Thaummatoglossa*; also, for your collection a ♀ *Th. americana* Jayne.

A few more *Hemicrepidius* have turned up which are herewith sent to you, and I take this opportunity of adding one of my specimens of *Acritus atomus* for kind examination and comparison. Where did Marseul "boggle" (or bozzle ??) this species. Referring to Marseul's Histeridae I see that the species was entirely unknown to him and that he simply reproduces (partly in translation) LeConte's description.

Do I correctly infer from your remarks that you do not possess *Mastogenius subcyaneus*? If so you are welcome to the two specimens in the box. There is no special hurry in returning the Brownsville *Mastogenius*.

Yours sincerely

E. A. SCHWARZ

The New St. Charles.

New Orleans, March 14th, 1906

Dear Dr. Howard,

Both Mr. Barber and myself have reached here all right but the train unfortunately arrived on time, which upsets all my calculations for the day. After ascertaining that there was no telegram for us announcing a further postponement of the Guatemala trip, we proceeded at once to the Office of the United Fruit Co. to see whether Prof. Cook had engaged berths on the next steamer to Puerto Barrios, but as soon as the agent became aware that we belonged to O. F. Cook's party he overwhelmed us with a flood of scoldings not always expressed in choice language. He said that Cook with his orders and counter-orders had made him nearly crazy. We had to take the lesson meekly although we made a feeble attempt to prove our innocence.

New Orleans is an excellent market for outfits for a tropical trip, and I regret that I purchased one half of my personal outfit in Washington. Prof. Cook and party arrived this morning two hours late, and we have taken out the necessary papers from the Guatemalan consul and also our berths on the steamer Olympia which is to sail to-morrow morning. It rains to-day heavily here and I feel sorry for Cook who is running about town to buy things. Our baggage is unfortunately heavy and I cannot imagine how we can manage to transport it over the mountains of Alta Vera Paz.

Mr. Barber's hand is progressing satisfactorily and I think he will be all right upon our arrival at Puerto Barrios.

I was very sorry that I could not see you last Saturday and Sunday and wish you a good trip to Europe and safe return.

Yours sincerely,

E. A. SCHWARZ

Cacao, Alta Vera Paz, Guatemala. March 28, 1906

Dear Dr. Howard,

I am glad to announce to you the safe arrival of the entire expedition at this place in the very midst of the high mountains and primaeval forests of this wonderful country. This being the dry season it has hitherto rained incessantly ever since our arrival which, however, did not prevent us from going into the field. Keleps are plentifully here at certain places but whether or not this is a good locality for making observations on the relations between the ants and the Boll weevils remains to be seen. At any rate the cotton patches are in a very poor condition and seem to have but little attraction to both ants and weevils.

Cacao is a house about 12 miles north of Panzos, elevation about 800 feet, and situated immediately at the base of the remarkable vertical cliff from which 13 waterfalls are descending—a very strange view. On top of this mountain at an altitude of nearly 2500 feet is the hacienda of Mr. Fickert-Forst a German gentleman, who treats us in the most hospitable way and to whom we owe all the comfort we enjoy in this wilderness.

The health of the party is good, Mr. Cook has a little attack from some fever and Barber is temporarily laid up from having

been attacked by a swarm of black Polistes. As to myself I am still suffering from the effect of a 10 hours' ride on horseback from Panzos to our bungalow.

Yours sincerely

E. A. SCHWARZ

Caccho Trere Aguas, Alta Vera Paz,
Guatemala, April 25, 1906

Dear Mr. Clifton,

Since Dr. Howard has presumably not yet returned from Europe, I address this note to you.

Our party is breaking up next week, Mr. O. F. Cook and Mr. Jordan expect, next Monday, to start on an overland expedition through El Peten to southern Mexico. This is a dangerous trip which will take one month or longer and on which the rest of the party cannot possibly follow him. On the other hand, Mr. Lewten, Barber and myself have such heavy baggage that it will be quite impracticable for us to go to Guatemala by way of Coban. Moreover, my experience in riding a horse or mule, on what they call here roads, is such that I refuse to make the trip.

To make the matter more complicated, the Ferrocarril del Norte does not take any passengers from Puerto Barrios to Raucha (from which place there are two days ride to Guatemala City). The United Fruit Co. steamers running from Puerto Barrios to New Orleans has long since stopped taking passengers to New Orleans or Mobile. After due deliberation we find that the only way to get out of this country is to get down to Livingston and wait there for the Hamburg-American liner which, in the course of 3 or 4 weeks will bring us to New York. We expect to carry out this plan and to start for Livingston toward the end of next week. There does not seem to be any yellow fever yet on this coast and a stay of a few days at Livingston will not hurt us.

Should we carry out this plan—and I have no doubt we will—the expenses of this trip will be much lower than anticipated, probably less than \$500 for each of us.

I shall write definitely next week. Our party is in tolerably good health in spite of the wet weather. Best regards to all in the Office.

Yours sincerely

E. A. SCHWARZ

Livingston, Guat.

May 5, 1906

Dear Dr. Marlatt,

After three days' traveling our party consisting of Messrs. Leroton, Barber and myself, safely reached the coast and are now waiting for the Hamburg-American line steamer which is said to leave here about the 10th and which makes the trip from here to New York in about 14 days.

The heat is very great here and there are quite a few *Stegomyia* in town though there is apparently no yellow fever here yet. In spite of this fact, every harbor on this coast has quarantined against the other and we cannot even get over to Puerto Barrios from which the United Fruit Co. steamer *Olympia* carrying the U. S. mail to New Orleans will leave next Monday. This note will go with this steamer and will reach you more than one week earlier than our arrival.

As I wrote to Mr. Clifton our expenses will be much less than anticipated, in fact less than \$500 for each, including transportation orders and requisitions.

The health of our party is good except that I am still sore from riding down from our mountain camp.

Yours sincerely,

E. A. SCHWARZ

Dallas, Tex., April 19th, 1907.

Dear Barber,

With some trouble I have reached this place but my hope of finding here warm and congenial weather was soon dissipated. When I came here on Monday the temperature was about 93° but the next day it fell within two hours to 44° so that everybody feels miserable. Yesterday afternoon it appeared to warm up a little but in the evening the wind came again from the north and to-day it is as cold as ever. Moreover, they had no rain in Texas since several weeks and everything is as dry as tinder.

The boys are working hard here and have found out various interesting points in the hibernating period of the Boll weevil. As a matter of course they put me to work at once to name their recent collections of Coleoptera which are quite considerable and

contain many good things though nothing of prime importance. The best things are a brand-new *Urodera* found by Pratt at Kerrville, and a fine new *Conotrachelus* found here by Pierce.

Yesterday afternoon when the weather was a little warmer Pratt and myself started out on a little excursion to a piece of timber near the Department cotton field, and using my umbrella I got within half an hour about a dozen species that are new to the Cotton boll weevil collection. I was quite surprised to find here such things as *Ino reclusa* and *Toxotropis fasciatus* which I always thought to be peculiar to southern Texas.

We have planned a great entomological excursion to the Devil's River (a little north and west from Del Rio on the Rio Grande) but we must await rain before starting on this expedition.

The laboratory here is well stocked with all kinds of entomological outfit, so there was no need for one to bring anything at all from Washington. The boys have even invented a new style of Cyanide bottle.

The letter of Clemons which you forwarded to me reached me this morning. I enclose it herewith so that you may know the situation. I regret very much the delay but this was unavoidable under the circumstances. Not being well supplied with cash at present I sent Douglas \$5.00 and beg you now to send him \$10.00 from the fund I left in your care. I wrote him not to use this money for ordinary purposes but to deposit it in a bank as an emergency fund.

It is so cold in the laboratory that I am hardly able to write. My health has not yet improved and I am quite exhausted from the little excursion of yesterday.

Yours sincerely,

E. A. SCHWARZ

Washington, D. C.

June 29th, 1909

Dear Herbert,

I have your letter of the 27th and although I regret that you shall not return here before the middle of next month I see from what you write that you enjoy your stay among the gypsy moth folks. I most sincerely regret to inform you that since you left here we had a great deal of trouble about Douglas Clemons. To

make it short after a few days of ailing he collapsed entirely and the most pronounced and aggravated case of tuberculosis developed. The doctor gives very little hope of his recovery but as a last resort we managed last Thursday to bring him on the train and he is now in Boulder, Colo. although I only heard that he has arrived at Denver and is still alive. He was of course unable to travel alone, so I persuaded Currie to take leave of absence and go along with him. I enclose the various postal cards and one letter which I have received from Currie.

This calamity affects me very much; I am quite nervous and take very little interest in any thing else.

Osgood has left Saturday for Chicago; Dr. Fisher is quite sick but expects to leave for the West sometime next week; McAtee will come to you next week to study the influence of birds on the Gipsy and Brown-tail moths.

Yours sincerely,

E. A. SCHWARZ

P. S. I got at the Office a *Phengodes* larva found in the stomach of an Armadillo at Kerville, Tex. The imagoes of your *Lopherus* developed all right.

E. A. S.

Washington, D. C.

July 1st, 1909.

Dear Herbert,

Since I know that you take much interest in our friend Clemons I enclose another letter from Currie which I received this morning. I wish you would write Douglas a line or two cheering him up as much as possible.

There is nothing new here. I had to leave my quarters at the Cosmos Club on account of the tearing down the two houses on Madison Square but I am already settled in my new quarters, 818 17th Str., now occupying the rooms vacated by Osgood.

The torrid weather still continues here.

Yours sincerely,

E. A. SCHWARZ

Address: Mr. Douglas Clemons,

The Boulder Tubercular Sanatorium,

West Pearl St.,

Boulder, Colo.

Ancon, Panama, Jan. 12th, 1911

Dear Dr. Howard,

Mr. Busck and myself arrived safely yesterday morning at Colon and after considerable amount of running about managed to get our railroad passes and other necessary things. We reached Ancon in the afternoon and were most kindly received by Dr. Canfield, but Mr. Jennings is sick and unable to help us along. This morning we met Colonel Goethals who at once took us in his automobile to his Office at Culebra where we were duly installed as employes of the Isthmian Canal Zone Commission. Other officials of the Commission like Dr. Gorgas and Col. Gailard have to be visited by us but it is not easy to find them. At any rate we have been most kindly treated by the Canal Zone people and there will be no difficulty in finding a suitable headquarters for us along the line.

Weather is delightfully warm but entomological operations have not yet commenced. Mr. Pittier is located at Culebra but we failed to find him this morning. Mr. Goldman is located at Gatun and Dr. Meek at Colon.

As soon as we are definitely settled I let you know our address; for the present letters will reach us c/o Mr. Jennings.

Yours very truly,

E. A. SCHWARZ

Paraiso, I.C.Z., Jan. 14, 1911

Dear Dr. Howard,

It takes a long time and much running about before one can settle down along the Canal Zone but after due deliberation and personal inspection we decided to make our headquarter at Paraiso which is on the eastern side of the Canal, a short distance from the Miraflores lock and on the line of the French railroad, but one mile distant from the new railroad. Entomologically speaking, this place seems to be the best that can be chosen within the Canal Zone and a walk of less than one mile brings us out of the devastated district into the wooded mountains where there is at least one little creek which is not Kerosened.

We have been assigned to a fine, airy room, in the hospital at Paraiso and almost everything we need is furnished partly by the Quartermaster Dep't and partly by the Sanitary Department.

Colonel Gorgas, Dr. Canfield and Mr. Jennings send their regards to you. Jennings is still sick and had to be transferred to the hospital at Ancon. Mr. Busck has caught a bad cold but has at once been attended to by the Sanitary Department. As to myself I enjoy this warm weather immensely and feel sure that the last trace of my rheumatism will have disappeared within a few days.

Yours sincerely,

E. A. SCHWARZ

Address of A. Busck and E. A. Schwarz:

Paraiso, I. C. Z. Panama.

Paraiso, I. C. Zone, Panama

February 3rd, 1911

Dear Dr. Howard,

Both Mr. Busck and myself are still at Paraiso and busy in exploring the insect fauna of the neighboring hills. In spite of the very pronounced dry season and of the fact that the entire arboreal flora has been destroyed by the Canal operations all over this district, insect life is tolerably abundant, and our collections rapidly increase both in extent and value. Our greatest enemy is the Sanitary Department which has most effectually done away, not only with the mosquitoes but also with all insects living in or near creeks and all other wet or moist places.

Agriculture on the Canal Zone is carried on in a very small and primitive way: here and there are a few scattered orange trees near the American or native houses but no trace of the Orange Aleyrodes can be found and hardly any Scale insects but the only colonies of Aphids I found were on Orange and on a native species of Viteò. Sugar cane has some common-looking Cutworms and a large Acronycta (or allied genus) as enemies. Owing to the prevalence of the House ants (*Monom. pharaonis* and *minutum*) we have hitherto failed to breed these and many other insects. The living Banana plants do not seem to have any important insect enemies but most Chrysomelid beetles (*Porphyraspis circumdata* and a host of Hispinæ) that feed in or on the allied plant genus Heliconia are also found on

the Banana. Corn is long since harvested and only the dry stalks are left; there are only a few forgotten ears left showing the work of *Meliophila* and harboring the usual fauna of Corn weevils and Sap-beetles (*Nitidulidae*) which are by no means always specifically distinct from those found in the States. Near the native huts an occasional Cotton tree (Pittier has a distinct name for it) can be seen. No trace of the Boll-weevil has hitherto been found by us but a good-sized, reddish *Pyralid* larva infests the bolls and its work resembles that of the weevil in the most deceptive way. We are trying to breed the moth. The rubber plantations are unfortunately remote from the Canal Zone in the few valleys which have not been kerosened by the Sanitary folks. I shall, however, visit a plantation which is about 4 miles east of Empire. There are hardly any other crops within our reach. Chickens seem to flourish here and there do not appear to be any chicken ticks; cattle, hogs, goats and sheep are not in favor with the Canal authorities and are raised only under strict regulations.

The Isthmus of Panama having no high mountain chains on either coast is the most arid and most unproductive part of Central America; its soil is too heavy and too shallow and in the dry season full of cracks. There is no even ground anywhere except in the Savannah region about the city of Panama (visited by us in a single day's excursion), and the hills are as steep as church steeples. Owing to the absolute dryness at this season the ground is excessively slippery and it is with the greatest difficulty that I climb the hills.

Mr. Busek had his eye severely injured by a branch of the climbing bamboo and had to go for a few days to the hospital at Ancon. Mr. Pittier is splendidly housed at Culebra, enjoys the use of Col. Gaillard's carriage, has a trained assistant (Mr. Christopherson from San Thomas) and a colored servant. He met with a severe accident nearly two weeks ago, breaking his wrist and straining two or three fingers. This does not prevent him, however, from going about and the other day he and the rest of the botanical force paid us a long visit to look at the big *Bauhinia* vine (about 300 yards long) and the new Coco (Cacao, *Theobroma*) tree discovered by us in the Paraiso hills.

Mr. Goldman (situated at Gatun) seems to be going on all right but is rather silent about his work. The other two members of the expedition, Dr. Meek and Mr. Hildebrand I have not yet met with; in fact it is difficult to find anyone along the Canal without making an appointment beforehand. Mr. Jennings is still sick but on the road to recovery.

I beg your pardon that I trouble you with this long letter. Mr. Busck and myself are in good health, and while I move about with the greatest care in the woods and along the steep trails I am still good for field work in the tropics and enjoy this warm weather.

Yours sincerely,

E. A. SCHWARZ

P. S. A consignment of six wooden boxes sent to me by the Bureau of Entomology has been duly received by me. These boxes are *no good* and three of them were broken when I got them. They are the most carelessly-made boxes I ever saw.

E. A. S.

Paraiso, February 13, 1911

Dear Dr. Howard,

Many thanks for your welcome letter of Jan. 23rd. If I am tardy in my replies please remember that two short excursions, or one longer excursion, each day; the taking care and packing of the collected material, writing diary and notes—are more than sufficient to tire out even the strongest entomologist.

No one seems to know exactly what is the matter with Mr. Jennings. Every week he is said to better but according to the latest report he will not be able to leave Ancon hospital for several weeks. Mr. Busck has recovered from his cold and injured eye, and the rest of the party, including the new arrival, Mr. Maxon, seem to go along all right including Mr. Pittier whose broken wrist of course can not heal so soon.

I am getting gradually acquainted with the localities along the Canal Zone, and it is very easy to reach from our headquarter at Paraiso any point along the Panama R. R. to make there an all-day excursion and to return to Paraiso at dusk. The smaller stations along the Canal have been much less thoroughly kero-

sened by the Sanitary folks than the big ones, and there is no want of collecting localities as good as one can expect during this dry weather. Thus we have visited the sabanas at Old Panama, Las Cruces (a native village on the Chagres), Matachin, Tabernilla and Bohio. The original forest has been cut down everywhere (with the stumps dynamited out), and the second growth, here called "djungle," forms an impenetrable thicket so that one has to collect along the trails which are sometimes tolerably good but sometimes very bad. There are no "hotels" in these smaller stations and usually no restaurants so that one has to take the evening train back to one of the larger places. Culebra, as the headquarter of the Engineering Department, has to be visited by us quite frequently (10 minutes rail road ride from Paraiso) since one can not do anything along the Canal Zone without having a permit from the "Colonels." There is no collecting locality at Culebra.

We get now tolerably well acquainted with the surroundings of Paraiso and since we also got considerable experience how insects can be found at this season, our collections are growing faster every day but there are hardly any large or brilliant things to be found (excepting butterflies which we do not collect). The grassy lawns (they are just as fine and clean as the White House grounds at Washington) which surround each large city here have an insect fauna which, with its small grasshoppers, common-looking Capsidae and small Flea-beetles, most strikingly resembles that found in similar localities in the States.

We are just making preparations for a larger trip to Porto Bello on the Atlantic coast and have secured the necessary permits and passes.

Last Saturday we got our first heavy rain shower lasting nearly half an hour, and myself got then my first thorough drenching from the outside although every day I get thoroughly wet from perspiration. The result is that I drink an immoderate amount of water (N. B. Paraiso is a temperance town without any kind of drinkables). Yesterday there was another heavy shower but I saw it coming over Ancon Hill and escaped.

On February 2nd and yesterday, Feb. 12th I sent you some boxes with insects, and am most anxious to learn of their arrival

in Washington. The great drawback of this Paraiso expedition is that it takes nearly 3 weeks before a reply reaches us from Washington.

Another lot of wooden packing boxes sent by you has been received by me. These were very carefully packed at your office but they are so poor that most of them arrived broken. Please do not send any more packing boxes since through the courtesy of the Commissary Department I can get suitable boxes at Paraiso.

I learn from Mr. Barber that Mons. Ernest Olivier of Paris (the grandson of the old entomologist Olivier and authority on Lampyrid beetles) has written to you requesting the loan of certain Lampyridae in the Nat. Collection. I recommend that his request be granted.

Mr. Busek sends his regards to you. Hoping that you and family are in good health, and with regards to all at the Office, I remain

Yours sincerely,

E. A. SCHWARZ

Address: Paraiso, Hospital, I. C. Zone.

[An Official Souvenir Postal, World's Columbian Exposition.
Showing picture of The Agricultural Bldg.]
To Dr. Howard.

The citizens of Panama are very angry that they shall not have the fair to celebrate the opening of the Panama Canal in 1915. So a building similar to that above will not be erected here in 1915. But it may be that the Centennial celebration of the Canal opening be held at Panama in 2015: Quien sabe?

Paraiso, I. C. Zone, Feb. 13, 1911

E. A. SCHWARZ

Porto Bello, Panama.

Febr. 19, 1911

Dear Barber,

As I wrote you before it is not any easy thing to write a letter on an entomology trip in the tropics. Two excursions each day are after all a severe strain to me and I am pretty well exhausted when I come home in the evening.

Paraiso is after all a very good place for insects in spite of the devastations by the canal work and so are the other stations along the line which I have visited with the exception of the large cities, Culebra and Empire. The northern end of the Canal Zone from Gatun to near Bohio is now almost entirely under water and lost forever to entomol. investigation.

Paraiso will continue to be our headquarters but for the present we are on a larger excursion to Porto Bello. This place is just the opposite extreme to the Canal Zone: the vegetation is only too vigorous and virgin and it rains here all the time. The country reminds me of Livingston, Guat. or of the hills along the Rio Dolce. There is a complete absence of trails on the peninsula where the American town of Porto Bello is with its enormous stone crushing apparatus but there are a few trails across the Bay (which is about one mile wide) leading out from the old Spanish town of P. Bello. One of these trails is the old paved road to the city of Panama; we have followed it for about a mile but often sank into the mud up to our knees. Around the American houses there is the usual thorough clearing of every tree or bush and the grass is cut every week; so there is no fauna on these lawns excepting a few common-looking grasshoppers. Further up the hills there is a zone where the trees have been cut down but where the grass and the new growth is only moved twice or three times a year. Here is a perfect wilderness of morn-ing glory vines and numerous other weeds, difficult to penetrate and here is an insect fauna not much different from that on the Canal Zone; but higher up the hill and west of the City extends the virgin forest unbroken for hundred of miles, reeking with moisture, full of vines and gigantic trees, without any trails. The insect fauna of this place is manifestly very rich and radically different from that of the Canal Zone but apparently very difficult to explore. We are here only a few days and probably have not yet met with the best localities but we expect to stay here for about a fortnight. The place is more troublesome to reach than it would appear from an inspection of the map. There is no possibility of taking a trunk along and the heavy hand baggage has to be carried (without anyone to help you) for more than a mile to reach dock No. 13 at Mt. Hope. There a little tug boat awaits

you which is much tossed about by the waves of the Caribbean Sea (you would have been badly seasick) but after 3 hours sailing the fine bay of Porto Bello is reached.

I have your letter of February 7th, also one from McAtee; also two letters forwarded by you. Many thanks for your kindness; the Cyanide and the fixative will not be forwarded to us from Paraiso. But on Washington's Birthday the Canal Commission furnishes a tug boat to the employees living at Porto Bello (which is a kind of prison) to spend the day at Colon or Panama and we intend to go along to look at our headquarter at Paraiso and to get some more clothing etc. I have also to attend the purchase of a new cheap watch, my own having broken its spring yesterday.

On two occasions I have sent specimens in pill boxes to Washington but have not heard of their arrival.

Yesterday was cold weather here, temperature only 72° at 6.30 a. m. and 84° at 2 p. m. and there were only 3 showers.

Our health is first rate and we are doing good work. With best regards to all at the office.

Yours sincerely,

E. A. SCHWARZ

Porto Bello, Panama,
Febr. 24th, 1911.

Dear Mr. Barber,

On February 22nd (Washington's Birthday) the Canal authorities furnished the tug Porto Bello to allow the workmen of Porto Bello to spend the day at Colon. Porto Bello is a kind of prison where nothing is going on not even base ball. Thus it was quite natural that a crowd of people went down at 6 o'clock a. m. We joined it but instead of spending the day at Colon we took at once the train to Panama where we had a good dinner and where I purchased for \$3.50 a new watch, the spring of my little watch having been broken some days ago. With this military discipline under which one has to live on the Canal Zone, a watch is indispensable. At 4 o'clock p. m. I took the train back to Paraiso where I found your packages (Cyanide, Fixative mixture and Reinforced Cigar boxes) in excellent condition; repacked my suitcase with additional material and on the next day took the morn-

ing train at 6.30 a. m. to Colon, took a carriage out to the lower end of pier no. 13 from which place we had to walk only a quarter of a mile to reach the tug Porto Bello which brought us to Porto Bello (sea being very rough) in 3 hours. Here we were treated at once with a tremendous rain shower which lasted for about two hours but before 4 o'clock p. m. I set out for a short evening excursion in the forest back of the old Spanish fort. Here I have, in the course of time, found various places where one can crawl in the forest for a short distance and where one is sure to find various interesting things without much loss of time. Thus we accomplished the round trip to Panama in 30 hours. This morning while I write this letter it is again raining heavily.

Now, I can not tell how much I miss your company here not only for the sake of entomology but because you would immensely enjoy this fine bay where all sorts of native and American canoes, steam launches, sail boats have a fine time, where there is good bathing at least at high tide, where one can watch the working of the big stone crusher and the loading of the big iron barges which bring the crushed stone directly to the dam at Gatun.

The Canal Zone proper is a very tame looking country. Imagine the little clearing around our house in Cacao and you have here near every station the same vegetation a little back from the "cultivated" zone where there is nothing but well trimmed lawns with a few nut palms standing as ornament. There are hills everywhere all very steep. If there are no houses built up to the very top these hills are covered with the remnants of the old forest; every good-sized tree having been cut and the small trees now standing being probably the second growth. The smaller stations along the Canal are somewhat better off than the larger ones and each (at least as far as visited by me) has a peculiarity of its own. The country around Panama with its queer open savannahs and its narrow bands of shrubbery in the hollows radically differs from the rest of the Canal Zone; the northern end of the Zone nearly as far as Bohio is now a Lake and lost forever to natural history. The water of the lake is constantly rising and by the end of the year will extend as far as Gorgona.

Whatever wagon roads exist at present in the Zone run parallel or nearly parallel to the railroad. There are many trails running

back into the country but you have to walk them since no horses or mules can be had except through the quartermaster Department. If you have your baggage brought from the house you inhabit to the station you must apply to the Chief Quartermaster for an order; and to obtain this requires at least two days. In spite of all these drawbacks the Canal Zone can be easily explored entomologically but not within 4 or 5 months and if we two entomologists are expected to accomplish an entom. survey of the Zone within this time, it is simply an impossibility.

But it is here in the Porto Bello region that two or more entomologists can do only fragmentary work in 3 or four weeks. South of Colon the mountains along the coast gradually increase in height, the mountains back of Porto Bello being about 3000 feet, at any rate high enough to catch and precipitate the moisture from the Carribean. Consequently it rains here all the year around and the forest growth is just as exuberant as along the Rio Dolce. From what collecting we have done here it is evident that the insect fauna is enormously rich but difficult to get at. I think I wrote before of the absence of trails on the peninsula where the American settlement is but in the meantime I found that the trail from Old Porto Bello to Colon is an ideal place for collecting. This trail being hardly passable in former years is now being improved in consequence of considerable pressure exerted by the American authorities upon the State of Panama. It is said to be "improved" for about 5 or 6 miles out of Porto Bello but I have followed it up so far for only about one mile where it still leads up to the first mountain ranges. It is cut through the primaeval forest and there is excellent collecting not only along the trail itself but still better wherever there is an opening, such as a little creek, into the dark forest. The number of insects we have found on this trail is simply astonishing, but it is very difficult to find a good series of specimens of a given species excepting a number of species which are of universal distribution throughout this region.

I have to close this letter so that it goes with to-day's mail. Our health is first rate though I begin to feel a little disgusted with the monotony of the food furnished by the commissary.

A letter from the Washington Academy of Sciences inclosing a bill and forwarded to me reached me to-day. Best regards to all friends at the Office.

Yours sincerely,

E. A. SCHWARZ

P. S. Please address letters as usual: Paraiso, Hospital, I. C. Zone. We expect here to stay about two weeks longer.

I have not yet received any news from Washington about the two sets of boxes I mailed from the Isthmus.

U. S. National Museum, Washington, D. C.

February 8, 1912

Mr. H. C. Fall,
191 N. Raymond Ave.,
Pasadena, Cal.
Dear Mr. Fall:—

If you knew how much Mr. Barber and myself are occupied with the routine work on the Coleoptera of the Bureau of Entomology and at the National Museum you would certainly pardon me for not attending to your request.

Ever since my return from Panama last spring, official routine work has been accumulating on my desk. Since Dr. Howard has consented that correspondents all over the globe are allowed to send their material in Coleoptera here for naming, the work has grown upon me beyond my capability. I wish that yourself and other trustworthy N. A. Coleopterists that desire to study up the Museum material of Coleoptera would come to Washington and pick out the material themselves. In such cases all the Museum demands is that the rules pertaining to the loan of Museum material be adhered to. I understand that you have been in the east last summer; you did not come to Washington, where the work of picking out the *Pachybrachys* could have been accomplished within a few days. As I told you above both Mr. Barber and myself have our hands full of routine work and it is difficult to see how we can manage to pick out and prepare for transportation the enormous material we have in N. American *Pachybrachys* not to speak of the material we have from Central America. However that may be, I promise you that both Mr. Barber

and myself will make a determined effort to prepare our *Pachybrachys* at once.

I am no authority on Cuban beetles, but I determined most of those I secured on that Island as best as I could and if you send on Floridian material which may possibly be identical with Cuban species I shall gladly attend to their possible determination. I merely want to say that the tropical fauna of Florida is in many regards by no means identical with that of Cuba, and that one must look, in the identification of species, not only to other islands of the West Indies, but also to species described from Yucatan and the lowlands of eastern Mexico. A short trip made two years ago to Tampico, Mexico was a revelation to me and a lot of Coleoptera occurring there, both described and undescribed are identical with South Floridian species.

Very truly yours,
(Signed) E. A. SCHWARZ,
Custodian of Coleoptera.

The Jefferson,
Key West, Fla., March 6th, 1912

Dear Dr. Howard,

I greatly regret that, last Monday, owing to rheumatism and want of time, I neglected to call on you in order to thank you for your kindness in allowing me to go South. I arrived here at 4 P. M. to-day, the weather being for the present much colder than I hoped to find. They had a severe winter here and very few spring flowers are out. Shall try and find to-morrow what may be left of my old hunting grounds.

Hoping all is well with you I remain

Yours sincerely,
E. A. SCHWARZ

The Jefferson,
Key West, Fla.,
March 6th, 1912

Dear Barber,

I arrived here at 4 p. m., the train being 6 hours late. It was raining all the way through and it is still raining here at Key

West. Moreover it is much colder here than I expected (71°) so that one can see many overcoats on the muddy streets.

The railroad trip across the Keys is of course mighty interesting. The road is certainly one of the most remarkable engineering feats ever attempted; still I would decline to travel over it during a good West Indian hurricane. Its construction has been disastrous to a goodly portion of the hammock and brush lands of the Keys; for the workmen or the engineers cut down every tree and shrub in a wide belt on either side of the track; I suppose in order to protect themselves against mosquitoes. Moreover there are at present no stations on the Keys; the only one being on Long Key, and this is a fishing camp, the island itself having no vegetation whatever excepting a few coconut trees.

It rains so heavy that I could not get out to see what kind of souvenir cards they have at this place.

Yours sincerely,

E. A. SCHWARZ

Key West, Fla., March 8, 1912

Dear Dr. Howard,

I am greatly obliged to you for sending me stationery, boxes, etc., all of which came to hand this afternoon.

It rained here yesterday (March 7th) nearly the whole day but late in the afternoon I took a carriage and drove over the island to look at the devastation of the native flora and fauna brought about lately by Mr. Flagler's "improvements." Magnificent boulevards extend now all over the island but unfortunately also right across my old hunting grounds so that there is very little left of the old shrubbery. To-day being beautifully warm and bright I started on my first excursion being out nearly four hours and walking about four miles. I was quite exhausted when I came back but found that at least a portion of the Key West fauna is still in existence. Within two years, however, no trace of it will be left. I hope and feel confident that this warm weather and the exercise will do me good.

Yours sincerely,

E. A. SCHWARZ

The Jefferson,
Key West, Fla.,
March 8th, 1912.

Dear Barber,

Many thanks for the boxes etc. you sent me and which came to hand this afternoon. Yesterday it continued to rain until 3 o'cl. p. m., but then I took a carriage and drove over this island to see what is left of my old hunting ground. To be sure there is not much left, the best part, i.e., the most elevated spots being converted into building lots, and broad boulevards cross the whole width and length of the island. To-day being warm and bright I ventured out on my first excursion and managed to be more than four hours in the brush. At least a portion of the Key West fauna is still left although many species, formerly common, seem to have become extinct, e.g., all the Cryptorhynchidae and many other weevils. I came home quite exhausted but recovered soon so that just now I have returned from an inspection of the electric lights of the town. This morning I got a fine *Xylophilus* which is new to our collection but strange to say I did not see a single Thrips. Tell Mr. Hood that the *Ficus indica* trees upon which in former years I saw millions of a gall-making thrips, have disappeared. I perspired freely during my excursion and I think this did me good.

Yours sincerely,

E. A. SCHWARZ

The Jefferson,
Key West, Fla.,
March 16, 1912

Dear Barber,

I have your two most welcome cards of March 11th and March 12th resp. Glad to hear that the Entomol. meeting went off all right; if I had been there, there would have been 36 persons present but there would not have been a wastage of lager beer.

...

Besides writing you on the 6th and 8th I sent you two cards on the 11th. I also sent to Dr. Howard 6 packages of which 3 contain Scolytid galleries and these I requested Dr. Howard to

turn over to Dr. Hopkins. The remaining three packages I requested to be turned over to you. There is not much of important material in them: in the pill boxes are not many specimens but some very good species. I was greatly surprised to find here the Ptinid genus *Pitnus* which was hitherto known only from Central America and Lower California, and greatly wonder whether the Key West species is different. All these specimens pasted in pill boxes can remain as they are until I come home but I am anxious that you make an effort to have determined the two plants viz. ?*Ilex* and ?*Piscicidium*. The specimens in the small alcoholic vials also do not need to be worked up but they should be put into a larger vial filled with alcohol. The living material is of very little consequence.

The weather has been fair and very warm here since last week but yesterday night a most violent rain storm broke over this island, flooding the entire town, and more rain is sure to come to-day. Fortunately there is no cold wave in sight and the temperature continues to be high.

On my first excursion here I got of course badly sunburnt and also acquired a very pronounced case of Neotrombidiosis. Mosquitoes (only two species of *Culex* and a rare *Anopheles*) are not very troublesome but there are millions of houseflies. No ticks here in spite of the many cattle.

I have been in the field every day for 4 or 5 hours but I take it easy and often rest during excursions. My health has improved in many ways, and only one thing will not get better, viz., the dumb pain across my chest which as I see now has no connection with rheumatism. This annoys me a great deal since it renders me unfit for any serious entomological field work and it would be foolish for me to extend this trip further South unless conditions change. So I have made up my mind to stay here for a week longer and wait for improvements.

The death of Dr. J. B. Smith, although not unexpected by me, affects me a great deal. I have known him for the last 38 years and we were always good friends. I think our Entom. Society should take some action in this matter.

I have again forgotten the initials of McAtee, Myers and the rest of the boys. Souvenir cards are of very poor quality here

in spite of the most beautiful marine scenery to be seen on all sides.

The restaurant attached to the Jefferson Hotel (the only decent one in the town) shut down for the summer the very first day I arrived here, and I take my meals in a Cuban restaurant where I enjoy Frijoles con arroz (just as in Cacao, Guatemala), Huevos fritos en plata, besides excellent fresh fish. The supply of fresh vegetables and fruits is very limited here but we have an abundance of ripe tomatoes and strawberries (these of course from Cuba).

Please give my best regards to all the boys in the Office.

I am closely watching the meteorological conditions in the North but can do it only by means of reading the New York Herald which we get here two days late.

Yours very sincerely,

E. A. SCHWARZ

Key West, Fla. March 17, 1912

To accompany Package No. 7

Dear Dr. Howard,

During the December, 1911, meeting of the Economic Entomologists there was a great deal of talk of Thrips and Thrips parasites. This reminded me of the "Laurel" Thrips of Cuba and Key West which occurs on the trees it infests in incredible number of specimens. Many years ago I sent specimens from Key West to the old Division of Entomology but I was never informed what species it is, nor did I ever find out what has been done with these specimens.

To-day I came across an infested tree which harbors many millions of specimens of this Thrips, each pseudogall containing several hundred specimens. The tree is a valuable shade tree and looks very badly when heavily infested.

Each pseudogall contains a few old, winged specimens, any number of immature specimens and any number of what may be the eggs.

I should not wonder if parasites could be bred from this species.

The tree is *Ficus indica* and the famous Prado in Habana is lined with them throughout its entire extent.

I suppose that Prof. Quaintance is the proper man to get this package.

Yours sincerely,

E. A. SCHWARZ

P. S. The box I sent contains only a small fraction of the galls that can be seen on a small branch.

U. S. National Museum,
Washington, D. C.

May 15, 1913

Dear Prof. Fall:—

I most cordially thank you for having sent to me an author's extra of your *Magdalis* paper. I glanced it over and it is certainly a good one. I am 'sorry that in the biological notes you omitted Hubbard's paper published in the first volume of *Psyche*, on the species affecting *Ulmus*.

I wonder, that in describing your genus *Trichomagdalis*, you failed to compare it with the genus *Carcilia* Roelofs. I think these two genera are synonyms, although we have no examples of species of this genus from Japan for comparison. I called Mr. Pierce's attention to this fact and after looking over the matter he participates in this opinion. The rest of your paper I have not looked into very carefully. I am interested in the synonymical remarks you have made but I feel awfully sorry for anyone that will take up a thorough study of our *Anthrenini* in view of the large number of isolated species that have been described since the publication of Mr. Dietz's synopsis.

Hoping that you are well or at any rate better off than myself, because I managed three weeks ago to break my collar bone. Mr. Barber sends also his regards and thanks for the copy of the paper you had sent to him.

Very sincerely,

(Signed) E. A. SCHWARZ

Cust. of Coleop.

Prof. H. C. Fall,
191 N. Raymond Ave.,
Pasadena, Calif.

Dear Dr. Howard, Tucson, Ariz., November 29th, 1913

It is not my intention to trouble you with a long letter. It suffices to say that Barber and myself have gone to work without

delay since our arrival at Tucson last Tuesday. We have visited Ventana Canyon and Sabina Canyon in the Catalina Mts, and the Sierrita Mts, some 30 miles southwest of Tucson and near the Baboquivari Range. To-day Barber has gone alone on horseback to Pima Canyon while I had to attend to the financial side of this trip. To-morrow (Sunday) will be an expedition, with Prof. Thurnber, to the Rincon Mts.

The weather has been very fine so far: very cold in the morning and evening, and beautifully warm during midday. The greatest drawbacks of this Expedition are: the shortness of the days; the great distances to be travelled in one day to reach the mountains; and the want of any accommodations in or near the mountains. The city of Tucson is the only available base in this part of the State from which mountain expeditions can be made and it is more than 15 miles distant from the nearest canyon.

It is too early to say whether or not our observations and information obtained on this trip will be of value. At any rate, Mr. Barber works with admirable energy and endurance, while I find myself unable, on account of old age, to do heavy mountain climbing, especially if such work has to be done in a hurry in order to get back to our wagon or automobile in a stated time.

Our living expenses are very moderate and we are also tolerably well housed, but wagons and especially autos are extremely expensive; for instance the auto to Sabina canyon (about 35 miles going and return) cost \$15.00 a day.

Prof. Thurnber is a splendid man and always willing to help us along; fortunately for us he is only too glad to accompany us on our trips whenever he can get away from his University duties.

Tucson has enormously improved since Hubbard and myself were here in 1898; the irrigated district in the immediate vicinity of the city has disappeared to make room for a new depot (the Nogales R. R.) and for real estate blocks, and the danger of being overrun by an auto while crossing the street is much greater than in Washington.

After a careful calculation I find that our money will be gone before we are through with even a part of our intended work,

and I beg of you therefore to hand the enclosed note to Mr. Clifton.

Hoping that these lines will find yourself, your family, and everyone in the office in good health I remain

Yours sincerely,

E. A. SCHWARZ

Tucson, Ariz. December 1st, 1913

Dear Dr. Howard,

I wrote you a letter on November 29th. On the same day Mr. Barber went up to Pima Canyon (which, by the way is only about 9 miles distant) and reported an interesting excursion among the Thurberias. Yesterday (Sunday) we made a big excursion, in company of Prof. Thurnber and one of his students to the Rimon Mts., about 30 miles southeast of Tucson. Although we had a powerful auto and started at an early hour, the day was altogether too short since it is absolutely necessary to go over the bad part of the road during the day light. Still Prof. Thurnber and Mr. Barber climbed up the mountain to an altitude of about 500 feet, reaching the upper limit of the Thurberias. During this very cold day we had rain and snow but returned to Tucson safely though very tired and considerably shaken up. As usual I dropped behind and did not reach the Thurberias but did some general collecting on the way.

To-day the weather is again very cold and we are packing specimens and rearranging baggage for a 3 days trip to the Santa Rita Mts.

We are both in good health.

Yours sincerely,

E. A. SCHWARZ.

P. S. Mr. Barber attends to the sending of packages with explanatory notes.

E. A. S.

U. S. National Museum. Washington, D. C.,

October 15, 1914

Dear Prof. Fall,

I most sincerely regret that there has been so great delay in my reply to your most welcome letter of September 19th, but it

reached me in the midst of a very severe attack of asthma which unfortunately continues.

Glad to hear that you have not abandoned your work on *Pachybrachis*. I knew that it would prove to be a hard job, and admire your courage in undertaking it.

I have spent some time in bibliographic researches regarding the authorship of *Pachybrachis* and enclosed I send you the necessary citations. The result is as follows:

If you are a follower of the modern rules of nomenclature you must use "*Pachybrachis*" Chevrolat and quote as the original date and place of publication Dejean's Catalogue 3rd. edition, 1834 or 1836. According to these rules a generic name is to be recognized as valid, even if it is not accompanied by a description, as long as it includes species described by previous authors (f. i. Fabricius, Olivier etc.). If you belong to that school of zoologists which does not follow these rules in their strictest sense you have to write *Pachybrachys* Suffrian and quote the year 1847 as the correct date. Redtenbacher's name *Pachybrachys* has no standing whatever, and it is quite astonishing to see that he is still followed by some recent writers f. i. Everts. I am afraid that, in order not to incur the ire of Dr. Stiles and the other members of the International Committee on Zool. Nomenclature, we have to write *Pachybrachis* Chevrolat.

The type of this genus has, as far as I know, never been designated but should no doubt be *P. hieroglyphicus* Laich. which is the most common and best known European species and which has a definite food-plant (*Salix*).

The American species of *Pachybrachis* are so troublesome because most of our Eastern species, and apparently also many of our western ones, do not appear to have any definite food-plant in the imago state and because their larvae (which unquestionably are all sac-bearers) are so difficult to find and do not feed upon the foliage of plants. In fact Mr. Barber and myself have bred only a single species, *P. tridens* from larvae found crawling under old leaves on the ground. The imago of *P. tridens* is also the only eastern species which seems to have a definite food plant viz. *Rhus toxicodendron*. Some of the larger species found by Barber & Schwarz at Williams, Ariz. occurred exclusively on

Pinus engelmanni and some of the smaller species from the desert region of Arizona have also definite food-plants but I failed to obtain the names of these plants from the poor specimens I gathered.

There are no biological notes on this genus at the Bureau of Entomology in Washington, none of the species having ever acquired an economic importance.

You may have possibly overlooked a synonymical note by Weise in Wiener Entomol. Zeitung., vol. 32, July, 1913, p. 219 where he changed the name *Pachybrachys elegans* Blatchley (pre-occupied by *P. elegans* Graells) to *P. praeclarus* Weise.

The use of the name *Scolochrus* Suffr. for *Griburius* Haldeman is to be rejected by all means. The French name "le gribouri" which is now the popular name for *Adoxus vitus* in France can not be found in any of the French dictionaries in common use, and I fail to understand the meaning of Chapuis' remarks in Lacordaire's "Genera," vol. X, page 167 (foot note) but it is possible that the name has some obscene meaning. Suffrian changes the name purely for philological reasons. *Griburius* is just as good a name as Horn's genus *Pemalus* or Casey's *Pappusus* or many other generic names.

I send you herewith a copy of Roelof's description of the Curculionid genus *Careilia* which I made for you many months ago. The genus must be very close to your *Trichomagdalis* but we have no species among our Japanese material.

I have some difficulty in writing with my lame hands but I hope you will be able to make out the larger portion of this long letter.

Yours very sincerely,

E. A. SCHWARZ

Washington, D. C. October 29, 1914

Dear Prof. Fall,

If I were in your place I would also use a little common sense instead of following the iron-clad rules of Nomenclature and write *Pachybrachys* Chevrolat in the same way as Dr. Leconte has done. By the way I notice that in Melsheimer's Catalogue of N. A. Coleoptera (1853) which has been edited by Haldeman and

Leconte the queer combination of *Pachybrachis* Suffrian is used. In the same Catalogue, p. 127 (footnote) there are some remarks by the Editors against the substitution of *Scolochrus* for *Griburicus*.

On the enclosed Slip 1 I send you a copy of Graell's description of *Pachybrachys elegans* with quotation. Weise's change of name is to be followed. This reminds me of the fact (probably not overlooked by you) that the name of *Pachybrachys limbatus* Newman (1840) is to be changed on account of *P. limbatus* Ménétries (1836 and 1838).

I see that I was not careful enough in my quotation of Suffrian's remarks in *Linnaea Entomol.* vol. II, 1847, p. 5 (continued on p. 6) and I enclose a copy thereof on Slip 2. Suffrian is certainly somewhat obscure in his remarks but had I continued reading up to p. 8 I would have seen that Suffrian understands his genus *Stylosomus* as the *Cryptocephali* without scutellum. On this p. 8 he gives a concise table of the European *Cryptocephali* (see enclosed copy on Slip 3) from which it is evident that he established the genus *Pachybrachys* in 1847 and not in 1848 as it is universally quoted.

Yours sincerely,

E. A. SCHWARZ

Mr. Charles W. Leng, although unable to submit any letters from Mr. Schwarz for this collection, was the happy recipient of some of the latest of Dr. Schwarz's written communications relating to Coleoptera in the form of notes and comments given on the galley proofs of the Leng Catalogue of Coleoptera of America, North of Mexico, published 1920. Just a few of these remarks, which covered every imaginable feature of the work, are given below.

Silpha truncata Say 23-193.—This is the type of the genus Philas Portevin 1903. Bull. Mus. d'hist. nat. Paris p. 331. The genus is a good one and should by all means be recognized.

Silpha surinamensis Fab.—belongs to *Necrodes* Leach.

Silpha lapponica Hbst.—belongs to *Thanatophilus* Samouelle 1819.

Silpha opaca L.—This is the type of Reitter's genus *Blitophaga*.

Colon elongatum Notman 19-98—is omitted. [Included in "Supplement."]

Ababa tantillus (Lec.) 65-96.—Type locality is Washington, D. C. Who found it in Mass.?

Attention is called to the omission of Leconte's Synopsis of Mordellidae 1862. pp. 43-51.

The entire family Euglenidae should be changed: since neither the genus *Euglenus* nor *Aderus* occur in N. A. the only way to give a catalogue of our species is to recognize Casey's genera as good from *Elonus* to *Axylophilus* and to omit *Euglenus* with synonyms you give and put

8510 *nucleus* (Fall)

8511 *constrictus* (Fall)

described as *Xylophilus*, which has lost its standing, under line preceding *Cnopus*.

The three forms of *Anthaxia* (*californica*, *pennsylvanica*, and *caseyi*) described by Obenberger, Ent. Blatt. 1914, pp. 25-26 should be brought in as unrecognized species at end of genus. They are probably all synonyms or at best varieties.

Hemipeplus microphthalmus Sz. 78-360 is quite distinct from *H. marginipennis* Lec. See Casey, Revision of Cucujidae, 1884, p. 101.

Hapalips texanus Schfr. belongs to Cryptophagidae, not Erotylidae. See Champion, Trans. Ent. Soc. London, 1913, p. 96.

Emmenastus rugosus Mots.—Mannerheim, Dritten Nachtrag zur kafer fauna, etc. 1853, p. 112, states that he has seen the type of Motschulsky's genus *Emmenastus* and states that it is nothing else but *Blapstinus*, the species being close to (and perhaps identical with) *Bl. pulverulentus* Esch. The genus should be listed as a synonym of *Blapstinus*. The sequence of genera of Bostrychidae as given by Lesne should be followed.

Endecatomus reticulatus (Hbst.) and *E. rugosus* (Rand.) are certainly not Bostrychids.

The various unrecognized species of *Mylabris* described by Motschulsky from Georgia have all to be omitted. The Georgia of Motschulsky is not in the U. S. but is a province of Russia now known as Transcaucasia.

Trachodes horridus Mann. 52-354 from Alaska, Vanc. belong to genus *Aparapion* Hampe, 61-63. See L. von Heyden D.E.Z. 1879, Vol. 23, p. 167.

Nanophyes pallidulus (Grav.) Eur. N. J. La. Colo? Found by myself at Alamosa, Colo, E.A.S.

Centrinus Schon. 26-308. Change to *Geraeus* Pascoe, 89-322 (*Centrinus* auct.).

At the close of the preface to his Catalogue Mr. Leng says: "Mr. Schwarz with his life-long study of the Coleoptera, his retentive memory, and his devotion to science, a devotion so great that it makes no task unwelcome in its service, has taken such a capable interest in the work that in succession, the manuscript, the galley proof, and page proof, have passed through his erudite and kindly criticism. His corrections are often specially acknowledged in footnotes, but no acknowledgment can fully convey the feeling of admiration and affection his help has aroused."

These sentiments of Mr. Leng and those expressed by Dr. Howard and others in Proceedings Washington Entomological Society, Vol. 30, No. 9 for December, 1928, are shared by everyone who had the good fortune to come into contact with this unique, wonderful and lovable being, Eugene Amandus Schwarz.

KEY WEST, FLA., March 6th 1912

Dear Barber,

I arrived here at 4 p.m., the train being 6 hours late. It was raining all the way through and it is still raining here at Key West. Moreover it is much colder here than I expected (71°) so that one can see many overcoats on the muddy streets.

The railroad trip across the Keys is of course mighty interesting. The road is certainly one of the most remarkable engineering feats ever attempted; still I would decline to travel over it during a good West Indian hurricane. Its construction has been disastrous to a goodly portion of the hammock and brush lands of the Keys; for the workmen or the engineers cut down every tree and shrub in a wide belt on either side of the track, I suppose in order to protect themselves against the mosquitoes. Moreover there are at present no stations on the Keys, the only one being on Long Key, and this is a fishing camp, the island itself having no vegetation whatever excepting a few Coconut trees.

It rains so heavy that I could not get out to see what kind of souvenir cards they have at this place.

Yours sincerely,
E. A. Schwarz